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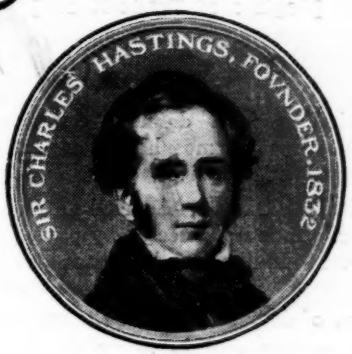

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A Lecture
ON
CANCER OF THE BREAST.*

BY
CECIL ROWNTREE, F.R.C.S.,
SURGEON TO THE CANCER HOSPITAL.

In at least one-third of the women who develop cancer it arises in the breast, and in that event the patient's average expectation of life is not more than four years unless she is fortunate enough to detect the tumour at an early stage, wise enough to consult a medical man at once, and brave enough to submit to surgical treatment. I do not suggest that even then she will always be cured of her disease—far from it, for recurrences after surgical operation are only too frequent. But it is probably fair to say that 30 per cent. of early cases get no recurrence after radical operative treatment, and it is certainly a fact that in the remaining cases a well planned operation will generally result in the patient being spared the dreadful misery and discomfort of an ulcerating growth in the breast, the ultimate cause of death being secondary deposits in the chest or abdomen, perhaps as long as ten years afterwards.

In order that the present results of surgery may be improved the co-operation of three parties is essential. The patient must consult her doctor at an earlier stage of the disease, the doctor must make a diagnosis at the earliest possible moment, and the surgeon must endeavour to perform the most scientific and most comprehensive operation that the conditions will permit.

The need for the co-operation of the patient is sufficiently obvious to require no emphasis, but how it is to be obtained is not so clear. If it were possible for every woman to learn that cancer of the breast starts as a little insignificant lump that is always at first quite painless, and that operative treatment offers the only chance of eradicating the disease, it is certain that a very few years would show a noticeable improvement in results.

How is this desirable end to be attained? Instruction at school has been suggested, but, even if feasible, would hardly meet requirements, for after all there are other forms of cancer to be considered. But I do think that more could be done during school life in the direction of teaching the elementary anatomy and physiology of the normal body and in emphasizing the importance of seeking medical advice as soon as any departure from the normal shows itself. Another method is the diffusion of information about the early signs of cancer by means of pamphlets, leaflets, etc., as already done by some medical officers of health, and on a more ambitious scale by the Franco-American Cancer League; but this is an expensive business and appeals to much too small a public. We have, however, in the huge circulation of the daily press a vehicle for propaganda that no one can escape, and if one or more of the daily papers were public-spirited enough to devote an occasional half-column to a clear description of the early stages of the common kinds of cancer nothing but good could result.

Early Diagnosis.

But it is to the subject of early diagnosis that I wish to pay special attention to-day, and it is here that the co-operation of the medical attendant is so essential; he is the most important link in the chain, and upon him the fate of the patient largely depends, for it is to him that the doubtful lump is first shown, and it rests with him to decide whether the lump is in fact a lump at all, and, if so, whether it is of any serious consequence.

I see that many textbooks still describe the symptoms of cancer of the breast in the terms I remember as a student over twenty years ago—a hard, irregular mass infiltrating the breast, causing retraction of the nipple, and accompanied by enlargement of the axillary glands.

We need not concern ourselves with such cases as these except, perhaps, to emphasize the importance of never waiting until such unequivocal signs declare themselves. It is the small and insignificant tumours that must engage our attention—they provide most of our difficulties in diagnosis, and these difficulties increase, I find, for I am certainly getting a larger proportion of quite early cases than I did some years ago. The sort of case I have in mind is a rounded mass, perhaps a quarter of an inch in diameter, movable in the breast, with no enlargement of axillary glands, no retraction of the nipple, and with no available history beyond the description of its accidental discovery the day before.

I am often asked by students whether there is not some one sign in the diagnosis of breast cancer upon which they may pin their faith and so simplify their task. There is, of course, no golden rule, but still there is a symptom which, although it is not of universal application, is of such overwhelming significance that I put it first, and a long way first, in diagnostic importance. I refer to adhesion between the growth and the skin overlying it—not the coarse and obvious infiltration met with in advanced cases, but a much more delicate involvement, resulting in a faint dimpling of the skin which is often of so slight a degree that it may only be visible after careful examination in suitable conditions of light. In its earliest stages it can be made to appear by grasping the breast on each side of the suspicious nodule and trying to push the skin away from the tumour. By then looking *along* the surface of the breast it may be possible to perceive slight irregularity in the contour not hitherto apparent. If this sign be evident—and it nearly always is when carefully looked for—I am convinced that a definite diagnosis of malignancy may be safely made with the utmost confidence irrespective of the presence or absence of retraction of the nipple, alteration in the size and shape of the breast, enlargement of glands, or any of the other classical signs of cancer. One is not likely to be misled by the adhesion of the scar of an old abscess or old operation wound, nor by the infiltration of recent inflammation.

On the other hand, absence of adhesion to the skin does not necessarily indicate that the tumour is benign, for the growth may be too small, or, if the breast be large and fat, the distance to the skin may be too great. In breasts of ordinary dimensions I have seen it present with a mass of growth no larger than a cherry-stone, but in smaller tumours than this it is not perceptible, and I think the difficulties of clinical diagnosis in this range of size are insuperable.

Mistakes in Diagnosis.

It is worth remembering that when mistakes are made in diagnosis they are nearly always in the same direction. An early cancer, because it is so small, so painless, and so harmless-looking, is thought to be a simple cyst or simple tumour, and is either left alone to await events or at most is locally excised. On two or three occasions I have been asked to perform the radical operation upon breasts from which had been removed small tumours thought to be innocent but subsequently proved to be malignant by microscopic examination.

I have also seen a woman of 30 with metastatic cancer of the spine from whose breast a small "adenoma" had been removed two years previously, and two other patients with metastatic fracture of the femur, both of whom had primary tumours in the breast which they had been told were of no importance.

Tiny cancers, tiny adenomata, and tiny cysts are dangerously alike. Cysts may be excluded by puncture with a hypodermic needle, but I know no way of distinguishing the characters of very early solid tumours, and in these cases it is our bounden duty to excise the mass and determine its nature. A surgeon who has familiarized himself by long training in museum and laboratory with the look and the feel of pathological tissues will generally be able to decide the nature of the case as soon as he has removed the doubtful tissue and cut it across. In a few cases he may find it impossible to come to a conclusion, and in these a microscopic section must be cut.

Frozen Sections.

I have never been able to convince myself of the value of rapid frozen sections in such cases, for, if an experienced surgeon is in doubt as to the nature of a tissue when he has a piece of it lying in his hand, it is almost certain to prove to be something out of the ordinary, and he is unlikely to get material help from sections prepared and considered by the rapid method. I feel that it is more safe to have the doubtful tissue suitably prepared by more deliberate methods and adjudicated upon in the seclusion of the pathological laboratory. Frozen sections have a very definite value in certain contingencies, but not, I think, in the differential diagnosis of obscure cases.

When faced with a difficult breast case it is always worth while considering the question of probability in relation to

* Delivered to the Fellowship of Medicine in February, 1923.

diagnosis. Here is an analysis of the last hundred consecutive cases of primary breast disease that I have seen in private practice, and I think you will be surprised to see that I have more cases of malignant disease than all other breast diseases put together.

One Hundred Consecutive Cases of Breast Disease.

Malignant—	
Carcinoma	58
Sarcoma	1
	59
Non-malignant—	
Fibro-adenoma	2
Duct papilloma	3
Sebaceous cyst	2
Tuberculosis	1
Chronic abscess	1
Galactocele	1
Solitary cyst	15
Cystic disease	1
Chronic mastitis	7
Subacute mastitis	8
	41

This enormous preponderance of cancer cases is no doubt partly to be explained by the fact that a certain number of them have only been sent to me for confirmation of diagnosis, for, when a woman is told that she has cancer of the breast by one surgeon, she often quite naturally asks to see another in the hope that she may get a different opinion. But in spite of this and other factors which tend in my list to put the cancer incidence too high, the general conclusion is inevitable that cancer is the commonest breast disease, and that a doubtful tumour in the breast, no matter how small and insignificant, is by the law of probability much more likely to be cancer than anything else.

Mastitis.

Another point arising out of my analysis that occasions some surprise is the small proportion of cases of chronic mastitis that I see. So much has been written about chronic mastitis that there is apt to be a totally false impression as to its frequency. I admit that it is a matter of some difficulty for me to obtain exact figures as to its relative frequency, for the cases attending my clinic at the Cancer Hospital obviously undergo as much or nearly as much selection as those in my private practice, and any statistics based upon them would certainly underestimate the proportion of cases of mastitis; but none the less I have come to believe that it is a relatively uncommon disease—almost certainly less common than cancer itself. The whole subject of mastitis is admittedly one of great difficulty and is fruitful in controversy; in fact, I am not sure that even yet there is any general consensus of opinion among surgeons and pathologists as to what really are the clinical characters and pathological appearances of chronic mastitis. It appears to me that there is often some confusion between chronic interstitial mastitis and subacute mastitis, although I believe them to be quite separate clinical entities with very different characters.

Subacute Mastitis.

Subacute mastitis is characterized by more or less sudden onset and by involvement of one and only one sector of the breast; it is always painful, it is generally unilateral, and it may be caused by such minor injuries as accompany games of golf or tennis or by vigorous spring cleaning. It is much more common in women with pendulous breasts, and is certainly predisposed to by the absence of suitable support for the breasts. It can generally be quickly cured by firm bandaging and the local application of belladonna, and its recurrence may be avoided by wearing a suitable bust bodice. In this disease cyst formation is conspicuously absent.

Chronic Mastitis.

Chronic interstitial mastitis, on the other hand, has an insidious onset and severe pain is generally absent; at most there is a slight aching. It is more often bilateral than subacute mastitis; it may affect more than one sector of the same breast, and I think it affects the nulliparous as frequently as the multiparous breast. It is probably closely associated with the involution of the breast accompanying the menopause, but it is often found in younger women.

Cyst formation is a very general feature of the disease, and the cysts may be large or small, many or few, but it is the exception not to find some cysts, possibly not larger than millet seeds.

If the cysts are numerous and large there is no room for argument about treatment. The breast or breasts should be removed by simple subcutaneous amputation, the nipple and surrounding skin being preserved by carrying the incision along the outer margin of the breast, but great care is necessary to avoid leaving an ugly puckered surface when this method is used. In thin patients I have given up employing it and prefer a straightforward amputation.

Solitary Cysts.

But it is quite common to meet with cases where there is but one solitary cyst in the breast. My own practice in these cases is to puncture the cyst and aspirate the contents. This is quite easily done with a serum syringe and hypodermic needle, and the cyst usually collapses so completely that nothing whatever can be felt of it.

It is possible, of course, that such a solitary cyst may be the herald of a general mastitic change which will eventuate in multiple cyst formation, and it is true that on a few occasions, after tapping the original cyst, I have subsequently watched the development of universal cystic disease which has required amputation of the breast. But this is certainly not the general rule, for my experience has been that most of my patients have had no further trouble, even after many years. The fluid in these cysts varies from a pale straw colour to brown or green, with perhaps cholesterin crystals floating in it, and all such cases are quite benign. But occasionally it will be found that the fluid is consistently blood-stained, and in these cases the cyst should be removed and carefully examined in case a growth has developed in its wall.

But if the case is simply chronic mastitis without obvious cyst formation, what line must be taken? Does chronic mastitis lead to cancer? Many experienced surgeons think it does. They believe it so firmly that they advise amputation of a breast so affected in order to be on the safe side, as it were. I cannot believe that the evidence is so conclusive as to lead us to offer this advice to our patients, and I strongly suspect that far too many breasts are sacrificed to this branch of prophylactic surgery. We should only allow ourselves to be guided by definite scientific evidence, and what is the evidence? It is stated that a large number of breasts removed for cancer show chronic mastitis as well, and the deduction is too readily drawn that the mastitis caused the cancer. Looked at from another point of view, one might equally well deduce that cancer causes mastitis; and in fact I believe it does—that is to say, I believe that chronic degenerative changes frequently take place in the breast tissue surrounding a malignant growth and that these changes are microscopically indistinguishable from the changes we are accustomed to describe as chronic mastitis.

From a purely pathological point of view the subject is obviously open to considerable discussion, but if we consider it from the clinical aspect the position becomes more clear.

If mastitis is indeed a common precursor of cancer, then we might expect that surgeons of experience would occasionally see patients with cancer whom they had previously treated for mastitis; or, conversely, it might be expected that some of the cases treated for mastitis would ultimately return with cancer. But it may be argued that it is scarcely likely that patients would return to the same surgeon. If this be true, then one ought to see patients with cancer who give a history of having been treated for mastitis some years previously by another surgeon. This has not been my own experience, nor, so far as I can gather, has it been the experience of those of my colleagues with whom I have discussed the question. Of all the cases of cancer of the breast that I have seen I can only find one where there was a definite history of previous mastitis. I saw this patient myself five years ago for mastitis and she returned last year with cancer. One would have expected mere coincidence to have provided more examples than this in any large group of cancer cases, apart altogether from any causal relationship. I am strongly of opinion that the bugbear of chronic mastitis as the precursor of cancer of the breast has been greatly overdone. It has even been suggested that the occurrence of mastitis resulting from intestinal stasis not only goes far to explain the frequency of cancer of the breast, but also explains its

greater frequency upon the left side owing to the fact that this particular type of mastitis appears to develop mainly in the left breast!

Side Affected.

It is certainly true that all the great collections of figures relating to cancer of the breast appear to indicate that it is more commonly met with on the left side, but the difference is less than 2 per cent. Were it not that this slight disproportion is so constantly reported by all observers, one would imagine it to be a mere coincidence; while, on the other hand, were it really due to any fundamental difference in the cancer liability of the two breasts, one would expect a much greater disproportion. I have often puzzled over this point, but it happened recently that two cases of cancer of the left breast were sent to me in quick succession, in each of which the doctor had accidentally discovered the growth while examining the heart. This must be the explanation of the discrepancy, for the vast majority of the published figures relate to operation cases, and it is, I think, reasonable to suppose that the accidental detection in this way of a small number of left-sided cases which might otherwise reach the inoperable stage without discovery fully accounts for the small apparent difference so constantly recorded. It would appear to be unnecessary, therefore, to fall back upon the left-sided mastitis of intestinal stasis—if there be any such thing—as having any very direct bearing upon the subject of cancer of the breast.

The most casual study of much recent literature relating to the breast and its diseases and minor ailments seems to indicate a fundamental lack of imagination or perspective. One is sometimes asked to believe that a trivial patch of mastitis or the presence of a minute cyst almost necessarily indicates the imminent onset of cancer. As I am not aware that such conditions are always or even generally confined to one breast, are we to be prepared to tell a patient to have both her breasts cut off merely to be on the safe side? We must preserve some sense of proportion and try to recognize that any evidence of the existence of a well defined precancerous condition in the breast recognizable by clinical or pathological methods is not yet established—whether in the shape of mastitis, cysts, or adenomata. I strongly feel that, unless or until we have unequivocal evidence to guide us, prophylactic amputation of the breast for mastitis is a thoroughly bad and unscientific proceeding.

TREATMENT.

The Radical Operation.

With regard to the radical operative treatment of cancer of the breast, I do not propose to discuss the details of the actual operation, for you all have many opportunities of seeing it performed and observing the various minor differences of incision, dissection, and technique favoured by individual surgeons; but I may say that, as one who is quite convinced of the value and importance of Handley's observations on lymphatic permeation, I endeavour to plan my operations upon this basis.

Not the least important matter is the choice of anaesthetic, and, after trying all available methods, I have come to the conclusion that for all ordinary cases ether, or a mixture of chloroform and ether, administered by some method which warms the vapour before delivery, seems to give the most satisfactory results; but in feeble patients who are bad risks owing to cardiac or respiratory complications or extreme old age I rely mainly upon local anaesthesia.

Thanks to the skill of my anaesthetists I have never yet lost a breast case from any cause whatever except, of course, recurrence of the disease.

Radium and X-Ray Treatment.

It is impossible to leave the question of the treatment of cancer of the breast without discussing the value of radium and *x*-ray treatment.

Radium.—With regard to radium there is very little to say, for the results obtained are not worth consideration. This is hardly a matter for surprise when we remember the extent of the area to be treated and the impossibility of obtaining and applying radium in sufficient quantity to influence the disease.

X rays.—In *x* rays, however, there is no question that we have a valuable means of relieving pain, encouraging hope, and prolonging life. They will in some cases promote the shrinkage of ulcerated masses, and in others will cause the temporary or even permanent disappearance of superficial nodules. I refer now to *x* rays as produced by the ordinary methods in common use, and every radiological clinic possesses serial photographs showing unmistakable evidence of the value of this form of *x*-ray treatment in cases of breast cancer.

Deep Therapy.

During the last two years a new technique has been evolved in Germany dependent upon the use of much more powerful apparatus, which is actuated by much higher voltages and emits a much harder and therefore much more penetrating *x* ray. It was hoped—indeed it was widely claimed—that this harder type of ray when delivered to the diseased part in appropriate quantities would destroy the cancer cells in their nests, as it were, with no—or at any rate no serious—injury to the surrounding healthy tissues.

As soon as the opportunity offered I arranged to give the method a trial, and about six months ago three cases of recurrent cancer of the breast were carefully selected. They were treated with the latest apparatus under the best obtainable conditions by a radiologist of the greatest ability. In each case the so-called full cancer dose of three hours or so was given, and now at the expiration of six months these are the results:

Case 1 feels better, but numerous skin nodules have appeared in the treated area. There is no improvement in the other local manifestations of the disease.

Case 2 felt strong and well until the treatment, but has suffered intolerable pain ever since it was applied. There is no improvement in the local condition, which in general has progressed except for the shrinkage of a small subcutaneous nodule.

Case 3 is unchanged except for the development of a suspicious nodule in the skin of the treated area.

These cases were done six months ago, and in those days—for events move quickly in the *x*-ray world—it was hoped that one exposure of three hours or so would suffice. The most that I hear claimed by my radiological friends to-day is that, given early cases of breast cancer free from metastatic growth, good results may be expected from repeated treatment — which is somewhat where we were before Erlangen.

I should like to emphasize the fact that it is only with regard to cancer of the breast that I am expressing my opinions, for my personal knowledge and experience of the results obtained in cancer of other organs is insufficient to form a judgement.

We have had our apparatus at the Cancer Hospital in full work for a few months only, and the tendency has been to use repeated moderate doses spread over an appreciable period of time rather than massive doses administered at a single sitting. However, we ought soon to be in a position to form a definite opinion, and we may find that it is only in certain kinds of cancer that useful results are to be expected from deep therapy. If there is any real analogy between *x* rays and radium, my experience with the latter would certainly tend to support such a view.

As I have already stated, I think radium useless in carcinoma of the breast, and the same applies to many other forms of cancer; but in certain situations, notably the cervix uteri, it is undoubtedly of the greatest value. Moreover, I find that I am improving my results in the cervix and elsewhere by using smaller quantities of radium but for very much longer periods, the tubes or needles being buried in the growth for days or weeks at a time. But even then there is no regularity in the reaction.

Recent pathological research appears to indicate so strongly a separate specific cause for each form of cancer that it is conceivable that further investigation may suggest the possibility of each form of cancer requiring its own specific remedy and perhaps its own specific wave-length—who knows? It is just possible that we may after all discover that *x*-ray technique has been developing in the wrong direction, and that the radiologist who is constantly striving after a harder and more penetrating ray is not very different from the surgeon who endeavours to improve his results by employing a longer, a stronger, and a sharper knife.

Finally, let me say that, if I have unwittingly underrated any man's achievements in the field of *x*-ray therapy, you as members of the Fellowship of Medicine—to whom all doors are open—should have abundant opportunities of correcting my estimate of the present position of deep therapy in the treatment of cancer of the breast.

BLOOD TRANSFUSION.*

BY

E. F. SKINNER, M.A., M.B., F.R.C.P.,

ASSISTANT PHYSICIAN, SHEFFIELD ROYAL HOSPITAL.

THE most obvious indication for blood transfusion is previous loss of blood, and the present revival of the operation is due largely to the brilliant results following this procedure in battle casualties. The shock condition produced by severe haemorrhage is due to two factors: (1) Loss of oxygen carriers, and (2) loss of blood volume; but whereas the latter can be quickly made good by the tissues pouring out fluid, except in those cases where the tissues themselves are drained of their fluids to such an extent that there is none left to replace blood loss, the former is only made good very slowly, and whilst by the injection of suitable solutions into the circulation the deficiency in blood volume can be replaced, the only means of replacing oxygen-carrying capacity is by means of blood transfusion.

Haemorrhages, whether sudden and severe, as in injuries and obstetric cases, or long-continued slight bleedings, equally benefit by transfusion, whilst the clinical anaemias, whether primary or secondary, are improved, and though in the case of the primary anaemias no permanent cure may yet be recorded, almost every observer has been struck with the occurrence of dramatic recoveries. But besides these conditions there are many others where blood transfusion may be of great value—for instance, in seriously ill persons before an obligatory operation the administration of 200 or 300 c.cm. of blood might entirely alter any possible end-result of surgical interference[1]; the terrible mortality of influenza and pneumonia[2] occurring in epidemic form might be lessened, and a number of successful cases have been recently reported from France. In the blood diseases—haemophilia, purpura haemorrhagica, and the like—there is again an obvious indication for blood transfusion, and Graham,[3] in a paper read before the Edinburgh Medico-Chirurgical Society, reported a series of 75 blood transfusions, amongst which were a number of instances of these conditions. Blair Bell[4] advocates its use in eclampsia, whilst Ramsay[5] refers to its gratifying employment in cases of acute nephritis. The employment of transfusion in septicaemic cases is advocated by some authors but deprecated by others, and Lewisholm[6] utters a warning against its routine use in septicaemia, but reports good results in staphylococcal osteomyelitis.

When such a varied list of diseased conditions is studied it is clear that the action of the blood is not the same in each case: that whereas in haemorrhage and anaemia probably the increased oxygen capacity of the circulating fluid is responsible for the benefit, this cannot apply to osteomyelitis, and in this type of case the possibility of "complement" or "antibody" transference must not be lost sight of.

The catastrophes that from time to time were observed to follow the intravenous administration of blood remained unexplained until it was discovered by Landsteiner[7] that when the blood serum of one individual was brought into contact with blood corpuscles from another individual there sometimes occurred a clumping of the corpuscles, with the formation of little conglomerate masses quite easily visible to the naked eye, and at once it was realized that in this phenomenon lay the explanation of these catastrophes—in other words, that there is an incompatibility of bloods of certain individuals, and that two such incompatibles cannot act as "donor" and "recipient" respectively in a transfusion operation, whence it follows that before each such operation the compatibility of the two bloods must be determined.

Compatibility of Blood.

In 1901 Landsteiner examined a large number of blood serums from the point of view of their property of agglutinating red blood cells, and as a result of his observations he stated that human beings could be divided into three classes according to the agglutinin content of their blood; these classes he called A, B, and C, in which the serum of Class A agglutinated the corpuscles of Class B, the serum of Class B agglutinated the corpuscles of Class A, whilst the serum of Class C agglutinated the corpuscles of both A and B classes (Fig. 1).

* A Post-graduate Lecture delivered before the Chesterfield Division of the British Medical Association, April 7th, 1922.

Moss[8] in 1910 repeated this work, but found that three groups were insufficient to cover all cases of agglutination, that if in a large number of different bloods the serum of each was mixed with the corpuscles of every other there were

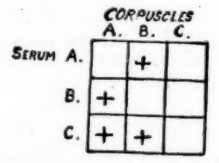

FIG. 1.—Landsteiner's original 3 group classification.

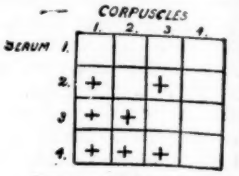

FIG. 2.—Moss's 4-group classification.

certain exceptions to Landsteiner's grouping, and he found that a four-class grouping was necessary to cover all cases, which groups he called I, II, III, and IV—a classification which is still adhered to for convenience and which is shown in Fig. 2.

Moss assumed the possession by the blood corpuscles of his groups of three different agglutinogens, each reacting with a specific agglutinin in the serum of another group, but this explanation is now simplified by an adaptation of Landsteiner's original conception worked out by von Dungern and Hirschfeld.[9]

This view is now known as Landsteiner's law of iso-agglutinins, and it sets forth that there are present in human blood two agglutinable substances, A and B, which react with specific agglutinins *a* and *b*, and that if any one blood contains an agglutinable substance it will contain the agglutinin which reacts with the alternative agglutinable substance; thus a blood which contains A agglutinable substance will contain the *b* agglutinin and vice versa. By the variation of these factors in the blood the four classes are determined and the supposed arrangement may be shown diagrammatically as in Fig. 3.

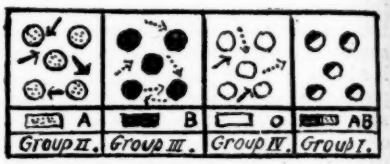

FIG. 3.—Landsteiner's law of iso-agglutinins (after Hirschfeld).

In the figure the English and American numerical groups are indicated and it will be seen that Group II possesses the agglutinable substance A and agglutinin *b*, Group III the agglutinable substance B and agglutinin *a*, whilst Group IV has both agglutinins but no agglutinable substance, and Group I has both agglutinable substances A and B but neither agglutinin. Therefore Landsteiner's law may be shortly stated thus: "In any blood there are always present agglutinins against the agglutinable substance absent from the same blood."

It is stated that shortly after birth[10] the blood takes up the characters of one of the four groups, and these apparently persist throughout life unchanged. In a personal investigation of this point I have found that at the moment of birth the child's blood may possess an agglutinable substance quite different from that of the mother's blood. Out of 17 such cases investigated this year, in 11 cases the blood of the child contained the same agglutinogens as the blood of the mother, whilst in 6 cases they were different.

Technique of Agglutination Tests.

The compatibility of any two bloods is shown by the non-appearance of agglutination when the serum of each is mixed with the corpuscles of the other, and by referring again to Moss's table (Fig. 2) it will be seen that by means of the serums of Groups II and III all samples of blood can be grouped according to their agglutinating properties: thus if a sample of blood is mixed with a little serum from a Group II blood and also with serum from a Group III blood, and agglutination occurs in both mixtures, the drop of blood comes from a Group I individual; if, on the other hand, no agglutination occurs in either mixture, then the blood being tested belongs to Group IV; if agglutination occurs with serum II the blood belongs to Group III, and if agglutination takes place in the serum III the blood under investigation is a Group II. With samples of serum from known Groups II and III it is possible to test out quickly any blood, and before a transfusion operation this must always be done. It is found that it is sufficient for practical purposes that the corpuscles of the blood from the donor should not be agglutinated by

the recipient's serum, for though theoretically the donor's serum may agglutinate the recipient's corpuscles this serum is so largely diluted that this does not prove any great danger and need not be considered.

Since the corpuscles of Group IV are agglutinated by no serum of any other group, the members of this group are spoken of as "universal donors," and generally such a Group IV blood is chosen for transfusion purposes if possible.

The testing out of the compatibility or otherwise of bloods is extremely simple, and can be done at the bedside. There are many ways of carrying out the test, but the simplest, and at the same time most reliable, is as follows:

Into a small test tube such as is used for the Wassermann reaction is placed a small quantity of N/10 sodium citrate in normal saline, and four or five large drops of blood, obtained by pricking the finger, are mixed with this citrate solution, giving an emulsion of red blood corpuscles. On to one end of a microscope slide is placed a drop of serum from a Group II blood, and on to the other end of the slide a drop of Group III serum, to each of which is then added a little of the corpuscle emulsion, each mixture being stirred with a smooth glass rod and the slide gently rocked to and fro. If agglutination occurs, it is quickly and unmistakably visible to the naked eye, and appears as a fine deposit resembling brick-dust, the particles of which often gradually get larger and larger as more and more corpuscles are agglutinated, until in some cases there appear a few deep crimson dots floating in clear serum.

Before any blood is used for transfusion it is essential to exclude the possibility of conveying any blood-borne disease, so that a Wassermann reaction should be carried out to exclude syphilis, and a careful history of all previous illnesses obtained; donors should be healthy adult males between the ages of 30 and 40 if possible, and during the next decade the possibility of conveying blood parasites should be kept in mind, in view of the large number of adult men who have been abroad during the war and contracted various tropical diseases —for example, malaria, filariasis, etc. Syphilis is said to have been conveyed by blood transfusion.[10] The previous occurrence in an individual of such conditions as acute rheumatism, trench fever, pneumonia, cerebro-spinal fever, typhoid, etc., should prevent such individual acting as a blood donor from the point of view of danger to the recipient, whilst albuminuria, even though transient, any cardiac debility, or marked obesity in a prospective donor should negative his employment on account of danger to himself.

Technique of Transfusion.

When a suitable blood donor has been obtained the actual operation of transfusion presents little difficulty, at any rate if the "citrate method" is employed, and as this method has the outstanding merit of being a "one-man" procedure, whereas the other methods, whether Kimpton's paraffin tube or any of the syringe methods, require skilled surgical team work, it will be the only one described here.

The apparatus required is a large wide-necked bottle capable of holding 700 to 800 c.cm. graduated in 50 c.cm., and provided with a rubber cork with three holes through which pass three glass tubes, the middle one of which is ground and tapered to fit the stem of a small separator funnel. To one of the side glass tubes, A, a length

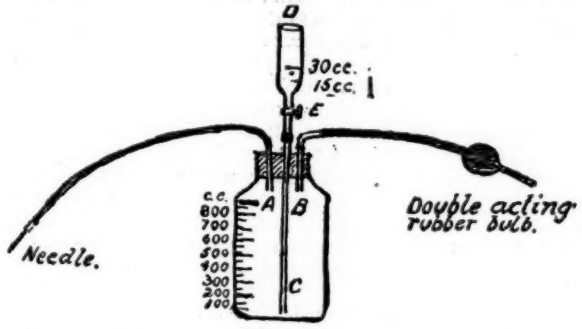

FIG. 4.

of rubber tubing of about 18 inches is attached carrying at its other end a needle with a fairly wide bore (from 1 to 1.5 mm.), whilst to the other side tube, B, is attached a double action bulb giving either a negative or positive pressure. On the centre tube, C, fits the special funnel, which has a capacity of 30 c.cm., and marked on the glass at the half-way or 15 c.cm. level, and provided with a stopcock, E. The apparatus is shown in sketch form in Fig. 4.

After sterilizing the whole apparatus blood is obtained from the donor in the following way. A solution of sodium citrate (3.5 per cent.) is poured into the bottle and allowed to run out through the needle by simply inverting the bottle, the other tubes being meanwhile stopped by means of short pieces of rubber tube clipped by "bulldog" artery forceps, and after the tube A has been thoroughly flushed the bottle is turned over again, leaving 15 c.cm. of citrate solution in the bottom. The funnel is next placed on the centre glass tube and filled with citrate solution up to the 30 c.cm. mark, the stopcock E being shut and the suction bulb attached to the other glass tube B, the tube A being clipped. The bottle is exhausted to a mild degree and the whole apparatus is ready for use.

The donor, lying down on a bed or table, has the arm cleansed and swabbed with iodine or picric acid, and after the antecubital veins have been rendered prominent by means of a tourniquet, or arm band, the needle is pushed directly into the vein, preferably in a distal direction, though this point is not of much importance, and the tube clip removed. Blood immediately flows into the bottle, and as soon as the 100 c.cm. mark has been reached the tap on the citrate funnel is turned and a further 15 c.cm. allowed to run in, the funnel being again filled up to the 50 c.cm. mark, and as each 50 c.cm. of blood runs into the bottle 15 c.cm. of citrate is allowed to pass in from the funnel. This is better than putting a large bulk of citrate into the bottle first, as one may not always obtain the total quantity of blood counted on. When the blood has been collected and thoroughly mixed with the citrate (the bottle should be kept constantly agitated whilst the collection is proceeding, being also warmed by standing in water at 100° F.), the funnel is detached and a small length of rubber tubing, suitably clipped, is substituted. The suction bulb is replaced by a similar piece of tubing and clip, and a somewhat finer needle is substituted for the collecting needle.

The recipient is similarly prepared as to the arm, and generally it is unnecessary to dissect out a vein, though at times in very collapsed patients this has to be done, so that it is always advisable to have at hand a little local anaesthetic, hypodermic syringe, scalpel, forceps, ligatures, etc. The bottle of blood is inverted and a little of the contents allowed to run out of the needle, which is then clipped off, whilst the clip on the middle tube is released to allow air to pass up into the bottle. The needle is then pushed into the recipient's vein, in the proximal direction, and the citrated blood allowed to run in slowly. Gravity is, as a rule, quite sufficient for the purpose, but occasionally a little positive pressure must be exerted, in which case the pressure bulb is attached to the centre tube, and if positive pressure is being used it is as well to have the cork fastened down, as otherwise it will be forced out. In Fig. 5 the bottle is shown in position for the gravitational giving of citrated blood.*

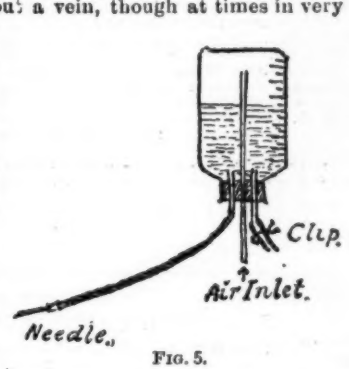

FIG. 5.

The actual amount of blood to be transfused at any one time will depend upon a variety of circumstances, and at present this aspect must be left to the discretion of the operator, as no unanimity has been reached, nor does the amount of citrate solution, within reason, seem to matter practically. This, however, is a point on which further light might be thrown with advantage, as I have seen one case in which unexpected symptoms developed during a transfusion within a few seconds of the blood beginning to flow, symptoms which were repeated four times as, for various reasons, four successive veins were punctured; and it was not until the following day that it was discovered that, owing to a clerical error, the citrate solution was being used in a strength of 30 per cent. instead of just over 3 per cent. The strength of the citrate solution when mixed with the blood in the way described above gives a resulting mixture of about 1 per cent. sodium citrate, and the time taken to infuse 500 c.cm., which may be looked upon as an average amount of citrated blood, should be from fifteen to twenty minutes, a slow transfusion being less liable to produce reactions and symptoms than a rapid one.

Reactions.

Certain reactions, however, do occur, and even in carefully tested bloods, where the agglutinin contents seem quite compatible, there is a slight risk which has been stated to be as high as 1 per cent.—a risk at present unexplained. If a reaction occurs it generally manifests itself during the actual operation, the recipient complaining of pain in the chest and difficulty of breathing, which may be accompanied by nausea or vomiting and sometimes the appearance of an urticarial rash and even loss of consciousness, but generally only the first stage of this reaction is seen and if the transfusion is stopped for a few moments and then allowed to proceed more slowly no more trouble is encountered.

Quite frequently, some thirty or forty minutes after the operation there is a "late" reaction, ushered in by a shiver or rigor, which may be slight or severe, accompanied by a mild pyrexia up to 100° F., lasting perhaps for twelve hours, and

* Messrs. Allen and Hanbury have made a very convenient outfit for me on these lines.

symptoms are more likely to occur if the operation is hurried; the more quietly everything is done and the fewer the number of persons present the better will it be tolerated; at present the method is looked upon as somewhat of a therapeutic curiosity and tends to attract too much attention.

Results.

It is as yet difficult to estimate the value of blood transfusion apart from its use in haemorrhagic shock, where its value is incontrovertible, since it is only too frequently resorted to as a last desperate hope. If it is to be of real assistance it must be used much more frequently and early, for its final value will not depend on the cases of gastric ulcer snatched from death, nor the occasional miraculous recovery of the pernicious anaemia patient, but rather on a sound understanding of its rationale and method of action, and such can only be discovered by frequent observations in large numbers of varying conditions. In those conditions where unknown metabolic processes are at work—for example, haemophilia, purpura haemorrhagica, haemorrhagic necrosis, etc.—much might be learned both of the value of blood transfusion, and even of the underlying factors of these pathological conditions, by carefully carried out observations; and, again, its rôle in such chronic infections as tuberculosis might be found to be not entirely useless.

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THE COMPOSITION OF THE GASES IN ARTIFICIAL PNEUMOTHORAX.

BY

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AND

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ON several occasions during the past year we have had the opportunity to obtain samples of gas from the thoracic cavity in patients with artificial pneumothorax. As our interest was thereby stimulated we carried out several experiments in which we produced artificial pneumothorax in animals—cats, rabbits, and a goat. We studied the composition of the air in the thoracic cavity, using Haldane's apparatus for the analysis of oxygen and carbonic acid. Our observations, although fairly numerous, form but a small contribution to the total, since the previous researches on this subject are extensive. We have made a study of the previous literature and consider that a critical review will be useful, seeing that the conclusions reached by different observers were so varied. As we are at present carrying out a research on the changes in composition of air injected into other body cavities and tissue spaces, and obtaining thereby rather striking results, we feel we are perhaps fortunately placed for a review of the afore-mentioned subject, and attempt herein to bring the different results, previously obtained, into line.

A very early research was that of Davy,[1] who in 1823 studied the gases in a case of pneumothorax. He obtained some of the gas from the thoracic cavity after the death of the patient. It was found that air had passed freely from the lung into the pleural cavity through a valvular ulcerated opening in the upper part of the superior lobe; the valvular opening prevented the air escaping again. Davy found 8 per cent. of carbon dioxide and 92 per cent. of nitrogen in the gas. He carried out numerous experiments on animals, injecting various gases and mixtures of gases—air and carbon dioxide, hydrogen and carbon dioxide, hydrogen and nitrous oxide gas. In the light of modern research, the older observers appear to have been much handicapped as regards the accuracy of their results owing to crude analytical methods. It seems hardly fair, then, to criticize their pioneer work.

Many important researches have been published in modern times. In 1914 Webb, Gilbert, James, and Havens[2] made extensive series of observations, mainly with the object of determining from a clinical point of view the best gas to inject to produce artificial pneumothorax, and concluded that, as Haldane had predicted, little, if any, clinical advantage was gained by the employment of nitrogen rather than atmospheric air for the production of artificial pneumothorax. Although they did not pay any great attention to or discuss fully the reasons for the changes in the composition of the injected gases, they gave very complete details of the analyses after the injection of oxygen, nitrogen, and air. Their figures for carbon dioxide in the imprisoned gas after many hours varied between 2.64 and 13.59 per cent., and the figures for oxygen varied between 0.41 and 8.66 per cent., except when pure oxygen was the gas injected into the thorax, the figures for oxygen percentage after forty-eight hours being then as high as 24.04 per cent. The remaining percentage, and therefore much the highest percentage, was made up by nitrogen. To quote these authors:

"The oxygen cases are especially noteworthy from the discovery of the large addition of nitrogen which must have diffused into the pleural space. Since blood contains only a small percentage of nitrogen (about 2.4 per cent.), diffusion must take place between alveolar air and pleural space to establish equilibrium. It would, therefore, seem certain that, whatever gas is used for the production of pneumothorax, it does not long remain pure; for Nature rapidly changes it until an analysis yields the equivalent of alveolar air. At our elevation (6,000 feet) alveolar air averages carbon dioxide 6 per cent., oxygen 14 per cent., and nitrogen 80 per cent.

"In general the longer the time between injections the higher the percentage of carbon dioxide and the lower the percentage of oxygen, the former tending to reach 10 per cent., and the latter 1 per cent. to zero."

The second paragraph just quoted contradicts the first paragraph as far as the oxygen is concerned. The first paragraph says the oxygen should be the same as in the alveolar air—that is, 14 per cent.—whereas the second paragraph states that the oxygen tends to reach from 1 per cent. to zero. It is quite obvious that their explanations are not sufficient to cover the variations given in their tables. They carried out an experiment under strictly physiological conditions with two monkeys. The right lungs of two monkeys of equal size and weight were collapsed under ether, one with 125 c.cm. of air and the other with the same amount of nitrogen. Forty-eight hours after positive pressure had been induced in this way the amount of gas still present in the monkey injected with air was 83 c.cm., and on analysis it gave carbon dioxide 8.06, oxygen 4.24, and nitrogen 87.70; whereas the amount of gas still present in the monkey injected with nitrogen was 92 c.cm., and on analysis it gave carbon dioxide 8.52, oxygen 5.61, and nitrogen 85.87. The figures show slight variation, but no conclusion may be drawn from them unless it was known that the lung in each monkey was collapsed to the same extent, or in other words that the circulation was similarly altered in both. These observers appear to have left the gases in the blood out of consideration, but, as has already been stated, the composition of the gases was not their main theme.

The blood gases have been very fully considered by Rist and Strohl[3] in their conclusions. They made a very careful physical study of the volume changes of the gases and of the changes in absolute quantities of the gases in the thoracic cavity following the injection of air, nitrogen, oxygen, and carbon dioxide. They represented these changes by means of graphs showing the variations in quantities and also in partial pressure at definite intervals after the injection of each gas. They concluded that several days after the operation for artificial pneumothorax—not complicated by purulent exudate—analysis of the gases contained in the pleural cavity proves that the composition of the gases is the same in all cases. The phenomena which occur after the injection of gas into the pleural cavity, according to these observers, are explained completely by the exchange of gases which takes place in the living body, and which consist of a diffusion through the pleural membrane with rapidity proportional to the coefficient for each gas, and depending on the partial pressure of each gas on each side of the membrane. Equilibrium, they state, is established between the gases of the pleural cavity and the venous blood, and they hold that their graphs show why different results have been obtained at different phases before the establishment of this equilibrium. It is well known that carbon dioxide diffuses twenty-five times more rapidly through tissues than does oxygen, and obviously allowance must be made for this and similar physical laws. Rist and Strohl found that after the injection of nitrogen and oxygen the total quantity of gas was increased for a short period, probably owing to the rapid diffusion of carbon dioxide out of the blood; thus is the phenomenon of over-compression explained. Some of our own experiments illustrate very clearly how rapidly the percentage of carbon dioxide rises in

air injected into the thoracic cavity. It was demonstrated in one of Dr. Clive Riviere's patients. He kindly allowed us to withdraw two samples immediately after he had produced artificial pneumothorax with air containing 0.03 per cent. of carbon dioxide. On July 14th, 1922, at 2.59 p.m. 100 c.cm. of air were injected slowly into the thoracic cavity of a boy; at 3.4 p.m. a sample was withdrawn which now contained 0.8 per cent. of carbon dioxide. From 3.5 p.m. to 3.11 another 300 c.cm. of air were injected; at 3.12 p.m. a sample was withdrawn which contained 1.93 per cent. of carbon dioxide (see Table IIB). Grass[4] obtained similar results.

TABLE I.
March 27th, 1922. Cat: Urethane.

Time.	Conditions.	Percentage Composition of Air in Thoracic Cavity.	
		CO_2.	O_2.
12.50	20 c.cm. of air injected*	—	—
12.53	Sample withdrawn	4.50	19.70
12.54	10 c.cm. of air injected	—	—
2.1	Sample withdrawn	6.10	15.00

* The composition of the air injected in all cases was approximately 20.93 per cent. oxygen, 0.03 per cent. carbon dioxide, and 79.04 per cent. nitrogen.

We injected 20 c.cm. of pure air containing 0.03 per cent. of carbon dioxide and 20.93 per cent. of oxygen into the thoracic cavity of an urethanized cat (see Table I) and found that after three minutes the percentage of carbon dioxide had risen to 4.50, whilst the percentage of oxygen had fallen only about 1 per cent. In the case of a goat the carbon dioxide rose from 0.03 to 3.56 per cent. in less than eight minutes after the injection of 300 c.cm. of air under local anaesthesia (see Table IIA). We are indebted to our colleague Dr. L. Colebrook for carrying out this operation. The oxygen in this experiment fell only about 1 per cent. in the same time.

TABLE IIA.
Goat: Local anaesthetic (L.C.).

Time.	Conditions.	Percentage Composition of Air in Thoracic Cavity.	
		CO_2.	O_2.
12.19 to 12.22	300 c.cm. of air injected	—	—
12.27	Sample withdrawn	3.56	19.70
12.31	Sample withdrawn	4.45	18.47
12.35	Sample withdrawn	4.74	18.04

TABLE IIB.
July 14th, 1922. Dr. Riviere's patient—Boy. Local anaesthetic.

Time.	Conditions.	Percentage Composition of Air in Thoracic Cavity.
		CO_2.
2.59 p.m.	100 c.cm. air injected into thoracic cavity	—
3.4	Sample withdrawn	0.80
3.5 to 3.11	300 c.cm. air injected into thoracic cavity	—
3.12	Sample withdrawn	1.93

Rist and Strohl were justified in excluding cases of pneumothorax attended by purulent exudate. It has long been known that the carbon dioxide percentage rises very high, as much as 11.5 per cent., in pathological fluids. Grass[4] found that in pneumothorax accompanied by exudate the carbon dioxide percentage was as high as 13.62, whereas in dry pneumothorax it averaged about 6. Pathological processes probably explain some of the high figures for carbon dioxide recorded in gases in pneumothorax. It must also be remembered that in physiological conditions the urine and the bile sometimes contain from 7 to 9 per cent. of carbon dioxide (Strassburg[5]); therefore it is reasonable to conclude that in the tissues where these secretions had formed the percentages must be about the same. Very recently Dunn and Thompson[6] pointed out that 9 per cent. of carbon dioxide must be recognized as a normal figure for the gases in the stomach. It might be expected, therefore, that the venous blood would sometimes normally contain a fairly high percentage; thus high percentages might be present in cases of pneumothorax, if Rist and Strohl are correct in their conclusion that the composition of the gases in the thoracic cavity depends on the gases in the venous blood. Recently, however, Rist and Strohl's work has been criticized by Dantrebande and Spehl,[7] who conclude that it is more correct to state that the carbon dioxide percentage in the thoracic cavity depends on the carbon dioxide present in the blood bathing the compressed lung, the blood of which is richer in the carbon dioxide than is the blood in the normal lung, because the compression slows the circulation. They also point out that Rist and Strohl used inaccurate figures for the volumes of gases in normal blood.

Another factor which must be taken into account is whether the pneumothorax is open—that is, whether there is a communication with the outside air or with the air in the lung by means of which air can pass freely into the thoracic cavity. Grass and Meiners[8] point out that this can easily be determined by analysing a sample of gas from the pneumothorax and then drawing out more gas; if there is an opening, fresh air will enter the thoracic cavity as the gas is being removed and the fresh air will thus lower the carbon dioxide percentage in the pneumothorax gas. Undoubtedly such a leakage may explain the very low figures for carbon dioxide given by some observers as being present in cases of pneumothorax.

At this stage we may sum up the position as regards carbon dioxide in the gases of pneumothorax as follows: The carbon dioxide percentage in the thoracic cavity comes into equilibrium fairly rapidly with the carbon dioxide in the blood bathing the compressed lung, unless pathological processes in the tissues of the lung or pleura cause a local increase—or perhaps occasionally decrease—of carbon dioxide, and unless there is a leakage of air into the cavity which will lower the percentage of carbon dioxide.

We consider that the equilibrium is established very rapidly between the injected air and the blood as regards the carbon dioxide. Of course the greater the quantity of air injected the longer the interval before the equilibrium will be established, but even at the latest a couple of hours should be the limit. Henderson and Haggard[9] have shown that after injecting 2 litres of air into the abdominal cavity of a dog equilibrium as regards carbon dioxide content was established in an hour and three-quarters. Our own results with gases in the stomach, intestine, bladder, in the thoracic and abdominal cavities, and under the skin (see Table III, A and B) gave very similar results, so that there is no reason to doubt that equilibrium is established very rapidly in the thoracic cavity—that is, of course, unless the tissues have become much thickened by pathological processes; but an extensive general thickening would be somewhat rare. It has been found that fat renders the diffusion of carbon dioxide slower, owing to low solubility of this gas in fat.

TABLE IIIA.
Cat: No anaesthetic.

Time.	Conditions.	Percentage CO_2 under the Skin.
11.0 a.m.	400 c.cm. of air injected under skin	—
1.0 p.m.	Sample withdrawn	5.21
2.25	Sample withdrawn	5.00
3.40	Sample withdrawn	5.20
4.10	Sample withdrawn	5.11

TABLE IIIB.
Rabbit: Urethane.

Time.	Conditions.	Percentage CO_2 in bladder.
12.30 p.m.	25 c.cm. injected into the bladder	—
1.15	Sample withdrawn	5.34
1.40	Sample withdrawn	5.80
2.10	Sample withdrawn	5.80

As regards the oxygen percentage in the gas of pneumothorax it is obvious that any leakage in the cavity will raise the percentage, owing to the entrance of air. In view of recent physiological research it seems that, if the gases are left undisturbed in the thoracic cavity, the oxygen percentage falls very slowly and finally becomes very much lower than that of the blood bathing the lung. It probably corresponds finally with the oxygen percentage in the surrounding tissue. In physiological experiments on monkeys Webb and his co-workers[2] obtained fairly low figures for oxygen percentage three days after the last injection of air and nitrogen, the percentages being 4.85 and 3.57 respectively; those figures probably represent the oxygen percentage of the surrounding tissues. They seem much too low for oxygen percentage in the blood of such monkeys. Henderson and Haggard[9] obtained low figures (about 6 per cent.) for oxygen in gas in the abdominal cavity; nevertheless the percentages they found were much higher than those—1 per cent. and less—given by Edkins[10] for oxygen in the stomach cavity.

Our own figures for oxygen percentage in gas in the abdominal cavity of normal animals resemble those of Henderson and Haggard.

Thus on November 3rd, 1922, at 12.30 p.m., 250 c.cm. of air were injected into the abdominal cavity of a rabbit (see Table IV); at

TABLE IV.
Rabbit: Urethane.

Date.	Time.	Conditions.	Percentage Composition of Air in Abdominal Cavity.	
1922.			CO_2.	O_2.
Nov. 3	12.30 p.m.	250 c.cm. air injected	—	—
	3.10	Sample withdrawn	4.67	15.66
Nov. 6	12.10 p.m.	Sample withdrawn	7.01	5.00
Nov. 7	11.50 a.m.	Sample withdrawn	6.42	5.31

3.10 p.m. on the same day the oxygen percentage was 15.66. On November 6th, at 12.10 p.m., the same gas being in the abdominal cavity, the percentage was 5.00, and on November 7th, at 11.50 a.m., the oxygen percentage was 5.31. We also obtained low oxygen percentages in air that had been under the skin of normal animals for some days. Thus air containing 20.93 per cent. oxygen was injected under the skin on February 2nd, 1923, at 5 p.m.; on February 5th, at 1 p.m., the percentage of oxygen was found to have fallen to 3.50 (see Table V).

TABLE V.
Rabbit: No anaesthetic.

Date.	Time.	Conditions.	Percentage Composition of Air under the Skin.	
1923.			CO_2.	O_2.
Feb. 2	5 p.m.	Air injected under skin	—	—
Feb. 5	1 p.m.	Sample withdrawn	8.23	3.50
Feb. 7	4.40 p.m.	Air injected under skin	—	—
Feb. 9	2.30 p.m.	—	8.13	3.55

It is possible that the oxygen tension varies somewhat in different tissues and also at different times in the same tissue. Very low figures, resembling those (1 per cent.) of Edkins for the stomach cavity, have been obtained in the gases in pneumothorax, so that in these cases the oxygen percentage in the surrounding tissue may have been the same. Pathological changes in the lungs and pleura, such as thickenings, would probably lower the oxygen percentage in these tissues,

TABLE VI.
Dr. Pask's patient.

Time.	Conditions.	Percentage Composition of Air in Thoracic Cavity.	
Hours.		CO_2.	O_2.
0	450 c.cm. oxygen injected into left pleural cavity	—	—
48	Sample withdrawn	4.90	15.34

as would also the presence of pathological exudates. Grass[4] found the percentage of oxygen to be about 1 in cases with exudate, whereas it averaged 4 in cases of dry pneumothorax.

Previous results, particularly those of Webb and his co-workers[2] and of Rist and Strohl,[3] and our own results, prove that any oxygen injected was very slowly absorbed by the tissues compared with the rate with which carbon dioxide diffused out from the tissues. Dr. Pask of High Carley, Ulverston, kindly allowed us to examine a sample of gas from the thoracic cavity of one of his patients. Two days after the injection of 450 c.cm. of pure oxygen the percentage of oxygen present in the cavity was still about 15 (see Table VI). Similar figures were obtained from patients by Webb and his co-workers.[2]

Summary.

1. The carbon dioxide percentage in the gases of pneumothorax appears to approximate very rapidly to that of the blood bathing the compressed lung. The volume of gas introduced in carrying out artificial pneumothorax may thus be increased at first, but not more than about 6 per cent.

2. The oxygen percentage in the gases of the pneumothorax cavity approximates very slowly to that in the tissues bounding the cavity. As nitrogen diffuses out equally, it makes little difference whether oxygen or air be used for inducing artificial pneumothorax.

3. Pathological fluids and tissues usually cause abnormally high percentages of carbon dioxide. Pathological changes probably lower the oxygen content.

4. Any leakage in the thoracic cavity lowers the carbon dioxide percentage, but increases the oxygen percentage in the imprisoned gas.

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STERILIZATION OF THE UNFIT.*

BY

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IF in this country the revolutionary suggestion be advanced of sterilizing the mentally defective children and preventing the marriage of those with mental weakness, or those having such a strong family history of insanity as to make it certain that idiots or mentally unfit offspring would result, it is quite evident that strong arguments in its favour must be adduced before legislation could be hoped for.

The Increase of Insanity.

On January 1st, 1922, the number of notified insane persons under care in England and Wales was 123,714, an increase of 3,370 on the number on January 1st, 1921. This increase followed one of 3,580 in 1920, and may be compared with the average annual increase of 2,251 for the ten years ending December 31st, 1914—the decade immediately preceding the war.[1] The mentally defective persons under care on January 1st, 1922, numbered 13,810 (males 6,326, females 7,484). Compared with the same date in the year previous this was a net increase of 1,784 patients.[1]

In Scotland on January 1st, 1922, exclusive of insane persons maintained at home by their natural guardians, there were 18,027 insane persons of whom there was official cognizance, including the inmates of training schools for imbecile children, who have not been certified under the Mental Deficiency Act, and of the Criminal Lunatic Department of Perth Prison.[2] The increase over the previous year was 221.

In Ireland on December 31st, 1919, there were 22,578 insane in various district, auxiliary, private asylums and mental hospitals; so that in Great Britain and Ireland there were at the dates mentioned no fewer than 178,129 affected.[3] This does not include all those cases affected mentally who are in sufficiently good circumstances to obviate the necessity of entering a public institution.

As the foregoing shows that there is an annual increase in these numbers, it is clear that there is urgent need to do all in our power to ameliorate this state of affairs.

It has been estimated by an eminent authority that there are at present in the United States of America[4] 42 institutions for the feeble-minded, 350 hospitals for the insane,

* Read before the Westminster and Holborn Division of the British Medical Association on April 12th, 1923. The discussion is reported at page 760.

23,000 juvenile delinquent institutions, 100,000 criminals, and 300,000 insane and feeble-minded.

This same authority estimates that two-thirds of these defective individuals are parents of defective children; this is evidence of the enormous importance of heredity and family history.

Heredity.

Heredity has been defined by Professor Thomson as "The genetic relation between successive generations."[5] Lock defines it as "The transference of similar characters from one generation of organisms to another, a process effected by means of the germ cells, or gametes."[6]

The hereditary substance represented by the sexual pronuclei which fuse together in the act of fertilization Nägeli calls by the name of idioplasm.[7] The resulting germ contains the images of two persons, and is therefore capable of transmitting by heredity their characteristics to the individual developed from it. In Mendel's experiments with the pea he called the character that prevailed *dominant*, and the character that was suppressed *recessive*. He found that a cross between a plant with a dominant character and a plant with a recessive character yielded offspring all resembling the dominant parent as regards the character in question. In the next generation the cross-bred plants were allowed to fertilize themselves, with the result that their offspring exhibited the two original forms, in the proportion on the average of three dominants to one recessive. When the recessives were allowed to fertilize themselves, they gave rise to recessives only for any number of generations.[8] Mendel's interpretation of the important set of facts he discovered was expressed in the theory of gametic segregation:

"The essential part of the discovery is the evidence that the germ cells or gametes produced by cross-bred organisms may, in respect of given characters, be of the pure parental types, and consequently incapable of transmitting the opposite character; that when such pure similar gametes of opposite sexes are united in fertilization, the individuals so formed are free from all taint of the cross; that there may be, in short, perfect, or almost perfect, discontinuity between these germs in respect of one of each pair of opposite characters."

It must be remembered that heredity and environment cannot be studied apart in relation to the development of children, for, however good the heredity may be in the case of a child, it cannot accomplish much without the influence of wholesome environment, which can be of such service in altering or modifying certain tendencies which are inborn. What Sir Frederick Mott calls "the fundamentals of the mind" are begotten with the body, and predetermine character and conduct. This has been demonstrated by Francis Galton's inquiry into the history of similar and dissimilar twins, which proves that dissimilar twins remain dissimilar in mental and bodily characters when brought up in the same environment, whilst similar twins brought up in different environment remain similar in mental and bodily characters. Environment, however, cannot produce mental power.[9] The experience and studies of numerous other investigators have led them to agree with Dr. Goddard's conclusion that two-thirds of all feeble-mindedness is due to heredity.[10] Dr. Barr, chief physician, Pennsylvania Training School for Feeble-minded Children, Elwyn, states:

"The family histories collated in the institutions and hospitals of our land form in themselves a library of tragedies which would convince the most sceptical of the magnitude of race suicide, increasing with each generation. In my individual study of 4,050 cases of imbecility I find 2,651, or 65.45 per cent., caused by malign heredities, and of these 1,030, or 25.43 per cent., are due to a direct inheritance of idiocy, and 280, or 6.91 per cent., to insanity."

Dr. Paul Bowers, who is superintendent of a hospital for the insane at Logansport, Indiana, has gathered data from a personal examination of more than 5,000 prisoners; he found that the antecedents of 44 per cent. of the examined convicts were psychopathic individuals, who were insane, feeble-minded, epileptic, criminal, or suffered from organic or functional disease of the nervous system.

On the other hand, careful inquiry into the family histories of the progenitors and the collateral members of ancestral stocks will generally show that a child born sound in mind and body is begotten by parents sound in mind and body themselves, whose stocks are free from any neuropathic or physical taint. Some consider that the heredity of mental deficiency is in accordance with the Mendelian laws if mental normality be regarded as the dominant and mental deficiency the recessive character. It has never been known for two mentally defective individuals to become the parents of a normal child.

The Sterilization of Mental Defectives.

The time has surely arrived when, instead of fostering the growth of the mentally defective, we should seriously consider the important problem of endeavouring to prevent their propagation. This can only be done by the sterilization of those who are definitely unfit to bring into the world healthy children. By the suggestion of sterilization, I do not mean asexualization, which has been practised in many countries for thousands of years. Experience has proved that the quieting of nerves and exaggerated emotional excitation is a primary and necessary factor in developing and training mental defectives, and as they suffer not only from mental and moral debility, but greatly exaggerated sexual impulses, asexualization is often of great service.[11] In ordinary sterilization there is nothing new, for it was known and practised by the Hebrews and Egyptians, in the South Sea Islands, among the American Indians, and in Scotland, on the insane, idiotic, epileptic, and on those suffering from transmissible disease. Plato suggested that the State should marry the best with the best, and the worst with the worst, and that the former should be encouraged to breed freely, while the offspring of the unfit should be destroyed. Aristotle was in favour of allowing children in excess of those required to die from exposure, all deformed children not being permitted to live.

The most frequent cause of congenital weak-mindedness is regarded by many to be neuropathic heredity. The subjects of mental deficiency are classified into idiots, semi-idiots, imbeciles or backward children, and moral imbeciles.[12] The incidence of idiocy among first-born is abnormally great, whilst the last child of a large family is liable to be weak-minded, apparently owing to the mother's nutrition being lowered by frequent pregnancies. Most children who acquire organic disease of the brain during infancy remain mentally defective, and epilepsy is responsible for about one-third of the cases.

Difficult labours are of considerable importance in the causation of mental deficiency, but in collective statistics in regard to these "difficult" labour is frequently accepted solely on the assertion of the mother. These statistics, however, seem to prove that a long labour is more prone to interfere with mental development late in life than forceps extraction.[13]

My own view, as that of others, is that when a child has been definitely pronounced by alienists to be of feeble mind, he or she ought to be prevented from ever having the chance of being a parent. Although this would be done for the advantage of the State, yet it is certainly for the benefit of the child, who, with no idea of responsibility, should be prevented in the future from bringing children into the world to be looked after by others. There is no interference with the sexual functions in the high-grade imbeciles, and moral imbeciles are especially apt to be troublesome.

In 1907 a law was enacted in the State of Indiana for the sterilization of confirmed criminals, idiots, imbeciles, and rapists. Since then other States have passed bills authorizing sterilization, and among them New York, Washington, New Jersey, California, Iowa, Connecticut, Utah, and Nebraska, as well as others. The terms of the Indiana law are:

"Whereas heredity plays an important part in the transmission of crime, idiocy, and imbecility, therefore be it enacted by the general assembly of the State of Indiana that on and after the passage of this Act it shall be compulsory for each and every institution in this State entrusted with the care of confirmed criminals, idiots, rapists and imbeciles, to appoint upon its staff, in addition to the regular institutional physician, two skilled surgeons of recognized ability, whose duty it shall be, in conjunction with the chief physician of such institution, to examine the mental and physical condition of such inmates as are recommended by the institutional physician and Board of Managers. If in the judgement of the Committee of Experts and the Board of Management procreation is inadvisable, and there is no probability of the improvement of the mental conditions of the inmate, it shall be lawful for the surgeon to perform such operation for the prevention of procreation as shall be decided upon as best and most effective. But this operation shall not be performed except in cases that have been pronounced unimprovable."

Prevention of Marriage with the Certainty of Mentally Deficient Offspring.

In a paper on "Sterility with reference to the State," which I read before the Section of Obstetrics and Gynaecology of the Royal Society of Medicine in March, 1922, I advocated, in order that mentally defective children should not be brought into the world, a State certificate of marriage. This would mean an Act of Parliament, and although one object

I have in view is legal sanction for sterilization of the unfit, yet such a certificate would obviate as far as possible the risk of marriage in persons affected mentally, or infected by the gonococcus, the *Spirochaeta pallida*, or tubercle bacillus. The ordinary family physician could give a certificate of health in the case of the female married for the first time; it would entail no more examination than is necessary for insuring life in any insurance office. The reasons which lead me to urge some such certificate are potent ones. The discovery of the presence of the infective organisms would enable the family attendant to advise the postponement of marriage until health was re-established. Gonorrhoea lessens the birth rate by preventing conception, and is the commonest cause of both absolute and relative sterility in women, the percentage being about 50 of all cases, and about 70 per cent. of the inflammatory infections in women are due to the gonococcus.[14]

It is estimated that syphilis causes about 25 per cent. of stillbirths and abortions, and at least 20 per cent. of the antenatal and neo-natal deaths.[15] This does not include those children with congenital syphilis surviving a month after birth, and who die later from debility, or who grow into delicate, puny children, always requiring extra care and attention. Of syphilitic women about 80 per cent. are married, and of the latter, according to Fournier, 75 per cent. have acquired it from the husband. Statistics regarding ten thousand consecutive labours in each of two American hospitals (the Johns Hopkins and Sloane) show that in the former the stillbirths due to syphilis were 32 per cent. of the total births up to fourteen days after birth, and that in the latter, 9 per cent. of the stillbirths were syphilitic, although all recognized cases of maternal syphilis were refused admission.[16] I do not suggest that men would willingly marry knowing themselves to be diseased, but examination would prove that they are or are not well enough for marriage, which could be postponed.

The strongest argument in favour of this certificate is that it would prevent the union of those with strong tendencies to insanity on either side, or those who showed signs of mental weakness, for they cannot be cured, and their offspring are defective. In the case of those with a strong history of insanity, or in presence of any mental deficiency, the certificate could be granted on the condition that one or both parties should be sterilized. This would prevent the unhappiness following the withholding of a certificate. The certificate would only be withheld in the case of the feeble-minded, or of a strong history of insanity on one or both sides, and in such cases the family physician would be bound to have the opinion of one—or if desired two—alienists. There is no suggestion that every possible care should not be taken with reference to withholding a certificate, for, as such a step necessarily entails an Act of Parliament, stringent regulations to safeguard the individual concerned, as well as the State, would be drawn up.

In some States of America, as already mentioned, sterilization of those mentally affected, as well as certain criminals, is already enforced. Although this is excellent as far as it goes, if sterilization were carried out earlier the vast majority of such persons would not be born. Although syphilis cannot be traced with certainty in Europe before the fifteenth century, it must, like gonorrhoea, have existed amongst the Egyptians from early times, and the reason more attention has not been paid to it until lately may be found in the fact that in former days its treatment was considered, especially by the Roman physicians, beneath their dignity. Although the effects of both the gonococcus and the *Spirochaeta pallida* are frequently terrible, yet, as there is now a possibility of complete cure, they cannot be compared with the appalling calamity of bringing into the world idiots and mentally affected children, whose condition cannot be cured, and who will, we know, if they survive and marry, certainly produce mentally defective offspring.

It is extraordinary how prolific these mental defectives are. Dr. Barr states that the sexual impulses are ever exaggerated, and they reproduce their kind from two to six times more rapidly than normal people. Dr. Bontor mentions a report of fifteen mentally deficient women who produced 116 children.[17]

Experience shows what such children will turn out to be in the future if they survive. They are feeble-minded, and more or less useless in the world, in spite of all the care bestowed on them in the training schools and other institutions in which they are well looked after. Although the cost to the State for the upbringing of these mental defectives is great it would not be complained of if permanent success followed the treatment. But, as Dr. Stansfield truly says,[18] the trend of modern civilization, by its Poor Law system and its treatment of the unfit during childhood, tends to foster the growth of this class. The care given to physically and mentally unfit children may reduce the degree of unfitness, but if their improvement is such as to enable them to escape the Mental Deficiency Act they are turned out mental, moral, and physical weaklings, to return to the environment which was associated with the development of this unfitness. This supports my suggestion, and is also a strong argument in favour of sterilizing confirmed criminals.

In my opinion sterilization ought to be regarded as a social relief to prevent the advent of mentally defective children. State certificate of marriage will confer a blessing upon our country, for it will ensure the advent of healthy children only. If it became legal to sterilize mentally defective children their survival would be productive of no harm. But even though legislative power be never given in respect of the mentally defective I have said enough upon the *Spirochaeta pallida* and the gonococcus to support the argument in favour of a State certificate of marriage.

Method of Sterilization.

Sterilization may be done in the male by vasectomy, a small incision, after the application of cocaine, being made in the scrotum in the situation of the epididymis, the vas deferens isolated, a loop drawn out and divided, and about one quarter of an inch cut from it. The distal end is tied, and the end nearer the testicle left open, so that the secretion from it may be absorbed into the blood, preventing any disorder of metabolism; the contents of the scrotal sac are returned, and the small wound closed. In the female, the Fallopian tubes are divided, and the ends nearest to the uterus tied. The ovarian end of the tube is left open, thus permitting the absorption of the ovarian secretion. Dr. Van Meter makes a small slit through the peritoneal covering of the tube at its proximal end. The oviduct is hooked up and severed at its uterine junction, the severed end reflected on the distal side out through the incision in the peritoneal covering, and the small incision closed with continuous stitches of fine catgut. If there should be the least suspicion of the uterus being unhealthy, the oviduct should be ligatured.[19] Sterilization may also be brought about in both sexes by *x* rays, but it must be remembered that whereas vasectomy and salpingectomy do not in any way interfere with the functions of the interstitial cells, either in the testicle or ovary, yet the *x* rays may possibly do so.

I have pointed out the influence of the gonococcus in producing inflammatory affections in women, and the enormous number of infant deaths which are due to syphilis. These two conditions alone, quite apart from the mental and physical sufferings entailed on the parent, are, in my opinion, amply sufficient reasons why the antecedent and present condition of anyone about to be married should be inquired into before granting a certificate of marriage. Sir Frederick Mott says:

> "For twenty years I was endeavouring to awaken the authorities to the necessity of combating venereal disease, for it was overwhelmingly proved that syphilis, besides being the sole cause of general paralysis of the insane, which accounts for 15 per cent. of admissions, is also a very frequent and sole cause of mental deficiency and organic dementia. Yet nothing was done until the Royal Commission on Venereal Diseases in 1914."

I have been particular to emphasize syphilis in my appeal for a State certificate, for it is a preventable disease. Everything which can be done to prevent the spread of syphilis will diminish enormously the proportion of cases admitted to hospitals, asylums, institutions for the blind, the deaf, and the dumb, and for mental deficiency due to congenital syphilis.

The authorities who can best give an opinion of real value are those who are superintendents of institutions for the feeble-minded. They assure us that, in spite of all we can do for these mentally defective children, they can never be really cured. As examples of what a man of defective mental type can do, I may quote family histories:

The first was carefully investigated by A. H. Estabrook.[20] The two sons of a mentally defective man married degenerate sisters, from whom six generations, numbering 1,200 persons, were born, of every grade of idleness, viciousness, pauperism, disease, idiocy, insanity, and criminality, and of the total more than half the women fell into prostitution. By the year 1915 the clan had reached the ninth generation, and increased its evil record. It had then numbered 2,820 individuals, half of whom were alive. Although the family was scattered widely over the country change of environment produced no benefit. They still showed "the same

feeble-mindedness, indolence, licentiousness, and dishonesty." The cost to the State had risen to 2,500,000 dollars. The one who investigated this family history most justly remarked that this evil might have been averted by preventing the reproduction of the first degenerate.

The second was the striking example of superiority and degeneracy in the well known case of the Kallikak family, published by H. H. Goddard.[21] A young soldier of good stock had a son by a feeble-minded girl, from whom there have descended in a direct line 480 individuals, of whom only 46 are known to have been normal. Of the rest, some are unknown or doubtful, and the others turned out to be feeble-minded, alcoholic, some of the women grossly immoral (mostly prostitutes), epileptics, and criminals. Years later he married a woman of good family, who bore several children, and the descendants turned out well, many of them being distinguished. The two families lived in the same environment.

These two families show what evil can be done from the feeble-minded scattered all over the empire.

In conclusion, I need hardly say that I am fully aware of the opposition my suggestion will meet with in this country, not only on sentimental grounds but on those of State interference with the liberty of the subject, and the possibility of evasions, which would certainly be attempted. Nevertheless, those who seriously consider what is best for the future of our race, in view of the facts I have mentioned, cannot but agree that it ought to be of the highest importance; we should at least endeavour to secure the advent of only healthy children, and as we have the means at our hand we ought to avail ourselves of them and prevent the propagation of the mentally defective.

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MINERS' NYSTAGMUS.

BY

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OPHTHALMIC REFEREE, COUNTY COURTS 1 AND 2.

IN the first report of the Miners' Nystagmus Committee, published last year, we read:

"The Committee have unanimously reached the following conclusions:

"1. The essential factor in the production of miners' nystagmus is deficient illumination. . . .

"2. The deficient illumination is due to the low illuminating power of the safety lamps generally used by miners. . . .

"3. Workers at the coal-face are more affected than other underground workers, and this appears to be due to the unrelieved blackness of the coal and the greater need for accurate vision.

"4. Distinct signs of nystagmus are present in a large proportion of coal miners, though only in a small proportion do the symptoms ever become so severe as to cause even temporary incapacity for work underground."

With these conclusions I think no one who has practical experience of the disease in the counties of Northumberland and Durham will agree, but of course unsupported assertions are absolutely useless in contesting the point. I have therefore, owing to the courtesy of the Coal Trade Office and of the officials at thirty-two pits in these two counties, obtained some details of 36,232 underground workers during the year 1922, with notes of the character of the illumination and of the average thickness of seams worked at each pit during that year. The numbers are sufficiently large for reliable statistical conclusions to be drawn from them.

The first point we wish to determine from the facts presented is whether in these pits deficiency of light or something connected with coal hewing is the more important cause.

Here what are technically called two attributes are to be investigated, and therefore four *independent* class frequencies must be given in order that a valid conclusion may be drawn. (If n attributes are under consideration, no conclusion can be drawn unless 2^n class frequencies are given, which must be independent of each other.) Of these 36,232 underground workers, 11,383 were hewers and 24,849 were non-hewers; 103 of the hewers and 59 of the non-hewers acquired nystagmus. It is only necessary to compare the proportion or the percentage of the nystagmus cases among the hewers with that of the nystagmus cases among the non-hewers—that is:

$$\frac{103}{11,383} : \frac{59}{24,849} \text{ or } 0.904858\% : 0.237434\%$$

Clearly, if the percentages were equal, nystagmus would be quite independent of hewing; if they were even nearly equal, deficiency of light might be the essential cause of the disease, but we see that the percentage amongst hewers is nearly four times greater than that amongst non-hewers, so we are driven to the conclusion that hewing, or something connected with hewing, is of far greater importance than mere deficiency of light. I have given the percentages to six decimal places when three figures would be quite enough, but I wished to guard against any ambiguity in using less exact figures. If hewing were the only cause of the disease, of course there would be no cases of nystagmus amongst the non-hewers. If both percentages be multiplied by the reciprocal of the greater $\left(\frac{1}{0.904858}\right)$ we get the ratio 1 : 0.2624. The difference $(1 - 0.2624 = 0.7376)$ gives a sort of measure of the degree of association, where 1 indicates complete association, and 0 indicates that the percentages are equal or that there is complete independence.

There are four other pits, employing altogether 7,452 underground workers; as the details about these are not so complete, for the period is not limited to the year 1922, they are here considered separately. On comparing the proportion of the nystagmus cases amongst the hewers with that amongst the non-hewers we have:

$$\frac{34}{2324} : \frac{20}{5128} = 1.463\% : 0.4179\% = 1 : 0.2856,$$

which gives the degree of association of hewing with nystagmus as 0.7144. When all the cases are added together, making a total of 43,684 underground workers, the degree of association becomes 0.7363.

It is true that the prevalence of nystagmus amongst hewers is noticed in the conclusion (3) of the report, but the explanation given is more than doubtful.

All underground workers are exposed to "the unrelieved blackness of the coal," and "the accurate vision" required by a hewer with a pick does not involve macular vision, but a keen sense of projection from extramacular parts of the retina, as has been so well insisted upon by Dr. Freeland Fergus under the name of alignment. I have examined several miners with macular vision less than 6/24 who have been admitted by their comrades as more efficient coal getters than themselves. In a very dim light macular vision is almost useless, for the fovea is a blind spot, as anyone can prove for himself.

I hold that nystagmus is excited by the long-continued strained position of the eyes in an unusual position. This view is no longer fashionable—chiefly, I believe, because it was found that the incidence of nystagmus was rather less in thin than in thick seams. But in undercutting a thin seam the miner lies on his side while the position of his eyes is rather downwards; whereas in top-holing a thick seam the gaze is directed obliquely upwards, a far more uncomfortable position for the eyes to maintain. Consequently, the greater frequency of nystagmus in thick seams supports the view that the constrained position of the eyes is the important factor in exciting the disease.

Unfortunately, in most cases only the average thickness of the seams worked at each pit has been given me—for example, St. Hilda, 3 ft. to 5 ft. 6 in.—so that it is impossible to draw any conclusions as to the incidence of the disease at 2 ft. and under, at 3 ft., 4 ft., 5 ft., as would have been desirable. In the few cases in which more precise data have been given the numbers are too small for any reliable conclusion to be drawn.

The same difficulty of insufficient data occurs with regard to the character of the illumination. Most of the pits use both oil lamps and electric lamps; in no pit are electric lamps used solely. I have been told that in the Dean and Chapter pit, where Messrs. Bolckow, Vaughan, and Co. had gone to the expense of providing excellent electric lamps to

the miners, the result only was to increase the cases of nystagmus notified. I have no wish to overstress this point, but I think that I have said enough to show that in this neighbourhood all the evidence is against deficiency of light being the principal cause of exciting the disease.

My own view is that there is a predisposition to the disease, that perhaps 5 per cent. of all children born have this idiosyncrasy, and that coal hewing is a very important factor in exciting an active nystagmus. Anyone who has once acquired miners' nystagmus will, after loss of all the symptoms, assuredly acquire it again if he returns to his old employment underground; at least, that is what my experience has taught me. I have seen two cases in accountants who said they always worked in a good light; these are analogous to Snell's ceiling paperer. If this contention be confirmed by others, the patient should never be allowed to go down a pit again, but must be given compensation for a limited period—say twelve months or so—while recovering from his symptoms, to give him time to obtain other employment.

POSTERIOR GRAVITY DRAINAGE IN EMPYEMA:

THE STRATEGIC SEAT OF ELECTION.

BY

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THE plan herein described has been employed, during the past two years, in a series of cases in the British Hospital, Buenos Aires, by my colleague Dr. Fehilly and by myself, with such uniformly satisfactory results that I think it merits the attention of those who have to intervene in this condition. The reason for its adoption was prolonged failure with other methods to prevent post-operative stagnation of pus within the pleural cavity, as evinced by general symptoms and by the quantity of discharge that always followed changing of tube, which only required a cough or alteration in the position of the patient to prove that the operation had failed to establish immediate automatic evacuation of purulent secretion.

Without wishing to detract from the general value of conclusions formulated on clinical deductions I am satisfied that in this instance surgical reasoning has, for generations, been unwittingly deflected by academic illusions. In the recent edition of Da Costa's *Surgery*, for instance, we find:

> "I agree with Hutton that a portion of the sixth rib in the mid-axillary line should be removed. . . . The reasons given by Hutton for the selection of this rib are . . . it is over the portion of lung which expands last. . . . An empyema is drained only partly by gravity, and most of the fluid is really forced out and the cavity is obliterated by lung expansion. . . . If an incision is made anterior or posterior to this point the expanding lung will block the drainage opening, and a pus cavity without drainage will remain in the mid-axillary line. . . . Such an incision permits a patient to lie on his back without making any pressure on the drainage tube."

A few days after the receipt of this new edition, Dr. Fehilly called my attention to the above statements, and after studying them, we went purposely to the wards and examined, in detail, the wounds of five post-operative cases that happened to be under treatment. The result was that, so far as our method was concerned, every line of Da Costa's quotations of Hutton's theories contained a travesty of fact. In four of the cases there was free dependent drainage of a sinus tracking upwards and inwards towards the spine, and in each of these the lung had expanded and air was freely entering the base in the axillary line. In the fifth, the most recently operated on, there was a well defined cavity directly in front of the opening completely shut off from the axillary border of the chest by adherent lung tissue. In each instance there had been prompt defervescence and marked daily decrease in the general symptoms. There was not the slightest reason for suspicion of any seconday pus cavity. The expanding lung did not cause an hour-glass contraction of the sinus, nor had it interfered with drainage in a single instance, and gravity drainage was perfect and in no way affected by dorsal decubitus, which position, by the way, the patients had voluntarily adopted during the first week after operation.

The result of these examinations confirmed previous experience of a method founded on anatomical facts—for example, Cunningham's *Anatomy*, p. 930, Fig. 630—and on *x*-ray study of the normal living thorax which demonstrated the existence of a distinct potential sulcus in the pleural cavity, between the scapular line and vertebra, beneath the ninth and tenth ribs, formed at the junction of the parietal and diaphragmatic pleura. This, combined with the fact that these patients do not pose in bed in the prone position but invariably assume a supine slope, and that those who have a resection of rib performed for empyema on textbook lines have a tendency to tilt the affected side upwards in order to avoid pressure pain, rendered it obvious that this posterior angle was the strategic site for gravity drainage in general suppurative pleuritis. And personal experience convinces me that the lung expands more rapidly if unhampered by having to force liquid uphill.

It is hardly necessary to add that this seat of election is the ideal one for an encysted empyema between lung and diaphragm, not to mention the ready ingress it affords in cases of suppurating hydatid cysts, abscess of the liver, or subdiaphragmatic abscess, which have perforated the diaphragm on their tracking to a bronchus.

In parenthesis I wish to remark that whenever an abscess or cyst is situated near the posterior surface of the liver posterior drainage should always be adopted; otherwise, as in ill placed thoracotomy for empyema, the "external" sinus or internal flask pocket is certain to remain. When practicable other subdiaphragmatic "collections" should be similarly dealt with. Whenever an exploring needle proves the existence of pus in the chest word is sent to the theatre to prepare at once for operation.

Before commencing local disinfection with the patient's elbow hanging at the side the inferior angle of the scapula is determined by the index finger, and from its tip a line two and a half inches long is traced vertically downwards with a stick of silver nitrate. The lower point of this line indicates the topographical position of the inferior border of the ninth rib, and affords a fixed central point for any form of subsequent incision for the evacuation of "free pus" from the pleural cavity.

Ether by the open method is administered, and the patient, with the elbow maintained at the side by an assistant, is carefully rolled over on the table sufficiently to facilitate the insertion of an exploring needle, and (if the result is positive) a four-inch curved incision is made, with its centre at the point above noted. With a few strokes of the knife the skin and subcutaneous tissue are divided, the fibres of the latissimus dorsi (which run upwards and outwards) are separated by a blunt dissector, strong retractors then make a free space for denuding and resecting two inches of the ninth rib, and a touch of a scalpel to the pleura completes an operation which depends on the behaviour of the divided intercostal artery as to whether it will be a one or three minutes' procedure. (*N.B.*—There must be no hesitation in removing two inches of the tenth rib in the same line if there should be any suspicion of defective dependent drainage.) Two short "gas-pipe" drainage tubes are then inserted into the cavity; these are transfixed with safety pins, under which a thin piece of gauze is packed lightly into the parietal wound, and dry gauze, wool, and a bandage applied. The outside dressing is changed as often as it becomes saturated until the second day, when it is superseded by a four-hourly warm mercury perchloride (1 in 3,000) fomentation, wrung dry. I never apply any form of impermeable tissue with a "perchloride" fomentation, which, by the way, I consider excellent in septic surgical cases. The drainage tubes are also removed on the second day, and two large wisps of silkworm gut substituted. These wisps are made by doubling twenty strands of silkworm gut and ligating them with a piece of fine silk about half an inch from each end. They afford excellent drainage, do not become foul, and never produce the pyogenic track which invariably accompanies the prolonged use of rubber tubes in wounds.

As soon as the patient can be safely raised into the sitting posture, and subject to no cough supervening, low level trickling irrigation with warm hydrogen peroxide solution (4 tablespoonfuls to a litre of water), followed instantly with warm carbolic lotion (1 tablespoonful to a litre) is carried out three times daily. The "peroxide carbolic" lotion rapidly diminishes smell and, in its own incomparable manner, promptly induces vigorous and healthy pale vermilion granulations. The wisps are removed prior to each irrigation, cleansed, and afterwards reinserted. (It may be well to mention that, to obviate the possibility of these wisps disappearing, the sister in charge ties each one, about the centre, with a piece of silk, and passes a safety pin internal to it.) All such cases are treated in the "continuous outdoor" manner, and are given generous diet with wine, beer, or stout with meals, with an occasional port wine and egg cocktail in

addition, *plus* mist. ferri et quininae, thrice a day. They are encouraged to get out of bed as soon as they feel fit to do so, as drainage is assured while standing, sitting, walking, or lying. Considering the rapidity with which these patients convalesce it is reasonable to hope that, in future, the opportunities for practising an "Estlander" or a decortication of pleura will be few and far between.

APPENDIX.

Since the above was sent for publication I have had various opportunities of confirming the statements therein contained. I wish now to add my most recent experience.

J. H. Q., aged 45, clerk, suffering from right "encysted" empyema—a diagnosis established by exploring needle striking pus in the tenth right intercostal space in the posterior scapular line.

On August 15th, 1922, a light dose of "open" ether was administered to the patient, who had been placed on an operating table (heated by electricity as previously mentioned by me in the BRITISH MEDICAL JOURNAL, February 4th, 1922). With needle puncture as centre a 3-inch incision was made, and over a pint of pus evacuated from a cavity bounded in the axillary border by the eighth, ninth, and tenth ribs, which were distinctly visible through the wound, roofed over by the inferior border of the non-collapsing right lung, which was seen adherent, in the axillary area, to the parietal pleura about the level of the lower border of the seventh rib, the diaphragm, with its dome in obvious perspective, forming the floor, and what was described above as a potential sulcus—namely, the posterior angle formed by the parieto-diaphragmatic pleural reflection—was palpably converted into an actual dependent pus fossa.

As the opening by incision seemed to provide ample room for drainage, resection of rib was omitted—a welcome coincidence as the patient was in a weak toxic condition. Temperature 102°, pulse 110.

Two large wisps of silkworm gut were inserted, transfixed by safety-pins, and dry dressing applied. The operation was completed in one minute.

Third Morning.—Free discharge had taken place since operation. One wisp removed; no pent-up pus followed its extraction. Temperature remaining at normal. Full diet given.

Seventh Day.—The vista, per wound, of "axillary" ribs had completely disappeared—the lung having visibly and audibly (auscultation) expanded downwards along the axillary border, completely obliterating the outer segment of the cavity.

Fourteenth Day.—Marked contraction had taken place—the track of wisp solely remained, the probe passing *inwards* and slightly upwards and forwards, between the dome of diaphragm and expanding lung, *towards the spine.* Air heard entering right base in a normal manner and through a normal extent *in the axillary line.*

Twenty-first Day.—Wisp had to be reduced to a few doubled strands. Sinus daily closing in without any internal flask pocket. Slight discharge. The patient was allowed out of bed.

Twenty-sixth Day.—Wisp omitted; discharge practically *nil.* Had gained 12 lb. since date of operation. Discharged cured four days later.

In order to avoid ambiguity I wish, finally, to stress a few obvious practical facts, which I can personally vouch for, as observed in this and all the other cases operated on by me through this posterior route.

1. Drainage at the posterior inferior pleural angle is aided by gravity—no rush, indeed not a drop of pent-up pus, has ever followed removal of wisp for the purpose of changing or cleansing same, even when the forcible cough test has been applied in the sitting or other posture. The dressings were continuously impregnated with discharge until the sinus closed. These two factors—as far as empyema is concerned—in my opinion constitute the term "free dependent drainage."

2. The lung in all cases first expanded downwards along the "axillary" wall, and invariably commenced its beneficent work by obliterating the outer segment of the cavity; from thence gradually continued its downward and inward expansion until the remaining sinus, which *always* passed inwards towards the spine, was occluded.

3. A wisp of silkworm gut, while maintaining perfect drainage, does not cause any necrosis or pyogenic lining along its track irrespective of the one retained *in situ.* (After the third day wisps are daily removed for cleansing.)

4. The result in the last case (45 years of age!) suggests that excision of rib may be an unnecessary adjunct when posterior gravity drainage is provided.

THE third Italian congress of war tuberculosis will be held at Trieste from May 13th to 17th.

DURING the present year the following well known Italian professors will have reached the age limit of 75 years: Leonardo Bianchi of Naples, Edoardo Maragliano of Genoa, Vittorio Grazzi of Pisa, Domenico Majocchi, Alfonso Poggi and Pietro Albertoni of Bologna, Pio Foa and Luigi Pagliani of Turin, Francesco Falchi of Pavia, and Luca de Rocco of Catania.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

TWO CASES OF "KNUCKLE PADS."

KNUCKLE pads are not very commonly met with and are very liable to be confused with other nodular excrescences found in the neighbourhood of the finger-joints. They are quite distinct from the osteophytes of rheumatoid arthritis, for which they are often mistaken, and though believed to be gouty in origin by Garrod[1] they are distinct from the deposits of sodium urate which are characteristic of that disease.

The nodules, which are about the size of a split pea, are situated on the dorsal surface of the fingers, most frequently at the first interphalangeal joint, though they may be present in other situations. The skin over them is normal in colour, and when the joints are extended they are slightly movable, but become fixed and often very painful on flexion. Pain in the nodules is not a constant factor; Case 1 had almost continuous pain, while Case 2 had no pain of any kind in the hands.

The nodules, once they have appeared, are permanent, but may enlarge and become painful, especially in wet weather. Dupuytren's contracture of the palm of the hand is often present and was well marked in one of the cases. Hale-White[2] considers the nodules to be a pure new growth of fibrous tissue, with some thickening of the stratum corneum with no evidence of inflammatory change.

Case 1.—Male, aged 39, a motor driver. He commenced with rheumatic pains in the hands seven years ago, and first noticed the nodules a year later. The nodules, which appeared in successive intervals of about two months, are situated on the middle, ring, and little fingers of both hands. They are very painful and tender to touch, especially in wet weather, and each one took about three months to reach full size. Dupuytren's contracture is well marked in the right hand. No other members of the family are similarly affected. The only evidence of rheumatism is slight creaking in both knee-joints.

Case 2.—Male, aged 42, schoolmaster. He has had slight rheumatic pains in the right shoulder for a number of years, but no pain in the hands. There is slight creaking in both knees with lipping of the iliac crests, but no other evidence of rheumatism. The nodules commenced to appear about three years ago; they are situated at the first interphalangeal joints of both hands, but are specially marked on the middle and ring fingers of both hands.

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POSTURAL TREATMENT IN LUNG DISEASE.

THE note in the *Epitome* of February 17th (139) on postural treatment for congestion of the lungs leads me to state that some twenty years ago, when acting as a locumtenent, I was given charge of a middle-aged woman who, I was told, was dying. She certainly looked very ill. Lung trouble had followed the extraction of a tooth, and she was bringing up purulent material, the smell of which permeated the whole house. Having read that bronchiectatic cavities could be emptied by posturing, I suggested that the foot of the bed should be raised and the patient made to lie without pillows. The patient objected, but the nurse persuaded her. The next day on entering the house I was struck by the fact that the smell was absent. I was shown half a chamber of putrid pus which the nurse told me ran out of the patient's mouth when the bed was tilted. The temperature, which had been raised for three weeks, fell to normal, and the patient was up and out three weeks later. At my first visit the patient was sitting up in bed propped up with pillows. The posturing was carried out in three-hour stages for a week.

During the war I had charge of the tuberculous ward in a native hospital. Having read of cavities being emptied by posturing, I tilted up the foot of the bed in one case. The ward master noted that not only was the patient better, but that he coughed much less, and asked if we might try posturing in all cases with cough. This was done; the bottles of sedative cough mixture lay untouched, and the ward was quiet in place of being disturbed by a cough here and a cough there as before.

In another hospital a European, who had lain for weeks in bed with a running temperature and signs in the lung of phthisis, was tilted up, and immediately his temperature fell and kept normal. He was going to be discharged, when the

[1] Garrod, A. E.: *St. Bartholomew's Hosp. Reports*, Vol. 29, p. 157; and BRITISH MEDICAL JOURNAL, 1904, ii, p. 8.
[2] Hale-White, W.: *Quart. Journ. Med.*, Vol. 1, p. 479.

temperature rose suddenly. His bed was tilted, and soon after the temperature fell. The tilting was carried out in three-hour stages for a week, and a week later as he felt well he left the hospital and I lost trace of him.

The patients liked the treatment and would ask to have their beds tilted. I have suggested this treatment in private practice, but an objection raised is that the bed may break.

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British Medical Association.

CLINICAL AND SCIENTIFIC PROCEEDINGS.

WESTMINSTER AND HOLBORN DIVISION.

Sterilization of the Unfit.

AT the annual meeting of the Westminster and Holborn Division of the Association, which took place, preceded by a dinner, at the Criterion Restaurant on April 12th, Dr. KENNETH HAY presiding, a paper was read by Dr. R. A. GIBBONS on the subject of a State certificate of marriage and the sterilization of the unfit. The paper is printed at page 754 this week.

In the discussion that followed Dr. B. DUNLOP declared himself entirely in agreement with Dr. Gibbons, although he approached the end which Dr. Gibbons had in view by a different route—namely, that of birth control propaganda. Syphilis was, perhaps, the chief factor in causing mental deficiency, and birth control advocates held strongly that the incidence of venereal infection would be largely diminished if celibacy or postponement of marriage no longer widely prevailed. A large proportion of people, especially amongst the better educated classes, were deterred from marriage by the fear of subsequent economic struggle. A rise in the marriage rate would be a very important factor in arresting syphilis. He had been interested in Dr. Gibbons's reference to the relative frequency of deficiency in the case of the first-born; he had discussed this subject with Major Leonard Darwin, who as a eugenist attributed the higher proportion of defectives—not necessarily mental defectives—among first-born to the risks to which they had been exposed at parturition. With regard to the operations described by Dr. Gibbons, it had been shown by recent investigations that such operations actually resulted in an improvement of the health of the individual, so that the objection on the ground of hardship was thereby met.

Dr. F. HOWARD HUMPHRIS noted that Dr. Gibbons had said that the operations he described did not interfere with the functions of the interstitial cells, either in the testicle or the ovary, whereas *x* rays did so interfere. The fact seemed to be, however, that *x* rays could bring about sterility while at the same time increasing potency. He quoted a foreign *x*-ray worker who had declared that while other tissues were affected by *x* rays to the point of actual degeneration, interstitial tissue more or less escaped. This same worker had practised temporary sterilization of husband and wife in alternate months by means of *x* rays, and according to the report this appeared to be as practicable a method of sterilization as surgical operation, while it had the advantage that afterwards it could be abandoned if it was thought that, after all, there was no harm in conception being allowed to take place.

Mr. C. E. WALLIS, as one who had been associated for twelve years with one of the largest industrial clinics for the treatment of imbeciles of both sexes, said that it was necessary to distinguish between the confirmed and hopeless imbecile and the improvable imbeciles. He could not imagine anything in the nature of operation upon these latter being tolerated in this country. Even such a trifling operation as vaccination aroused intense opposition in some quarters. But while operation would not be tolerated, it was possible that *x*-ray applications, especially if they caused only a temporary sterilization, might be regarded with more tolerance.

Dr. KENNETH DICKSON said that it was very important for medical men to take an interest in these sociological subjects. The bulk of the profession needed converting to the duty of having and expressing an opinion on these matters. An ex-superintendent of the Indian police had told him that on such a subject as the reform of the criminal classes in India the medical men out there had nothing to say, regarding it as a question beyond their concern. But the medical profession was the only united body of men whose opinions on such subjects were likely to be adopted by the community if they were supported by reasonable arguments. It seemed strange that the greatest propagandist in these sociological fields should be a highly distinguished churchman. Dean Inge would go down into history as one of the philosophers of the present day—one who was judged to be a pessimist only because he refused to prophesy smooth things—and the medical profession would do well to follow such a man in his efforts to educate public opinion.

Mr. A. L. W. WHITEHOUSE reminded the meeting of the various instances of genius allied to insanity or mental instability, and urged that the point of view of the ordinary citizen might be that sterilization would have a regrettable consequence in stopping the supply of Byrons and Samuel Johnsons.

Dr. GIBBONS, in reply, made it clear that his paper had nothing to do with birth control. The object he had in view was to secure the bringing into the world of healthy children, that all about to be married should have a State certificate of health, and if such could not be given marriage should be postponed for the time being. The raising of the age of marriage, of course, lessened fertility. The average number of children to a marriage, supposing the marriage to be fertile for the full child-bearing period, should be ten. Four children to a marriage were necessary to continue the State in view of the fact that some would die before maturity and some would not marry. But the results of the voluntary confidential census among intellectuals showed that the average number of children to a marriage was less than two. This would do away in time with the need for birth control propaganda. Already in France the seriousness of the position was realized and strong action was taken with regard to contraceptives. With regard to the first-born the frequency of defect might be due to difficult labour. He had often found also that the last child of five or six was deficient, apparently because the nutrition of the mother had run down. With regard to *x* rays he had been of opinion that powerful *x* rays must certainly affect the interstitial cells, though about that, of course, only an *x*-ray expert could speak.

Reports of Societies.

OSTEO-ARTHRITIS AND RHEUMATOID ARTHRITIS.

A GENERAL meeting of Fellows of the Royal Society of Medicine was held on April 23rd, with the President, Sir WILLIAM HALE-WHITE, in the chair. The meeting discussed the question of osteo-arthritis and rheumatoid arthritis.

Sir ARCHIBALD E. GARROD opened the discussion. After a gracious and graceful allusion to the pioneers of the past, he said that these chronic articular diseases formed a very obscure part of medicine. We had lost our way in a fog. Cross-classifications and multiple nomenclatures were sure signs of ignorance. The osteo-arthritic lesions developed insidiously in old people. Often there was no antecedent acute or subacute arthritis; but osteo-arthritic changes might develop from any prolonged or recurrent inflammatory lesion—witness the arthritis of haemophilia. All were familiar with the knee joint trouble of middle-aged women. These lesions were quite distinct from infective troubles—these he preferred to class under the heading of rheumatoid arthritis. Immense changes had taken place during the last thirty-five years in their conception both of rheumatoid and osteo-arthritis. They were, however, not much advanced in relieving the conditions; indeed, there were still some who did not believe in the difference between the two conditions. There was a decided difference in distribution. Osteo-arthritis attacked frequently the end-joints of the hands—joints little affected by the more acute disease. The carpo-metacarpal joint of the thumb was frequently the site of osteo-arthritic changes, but was little liable to damage by infective rheumatoid troubles. Sir Arbuthnot Lane had many years ago insisted on wear and tear as an important factor in the cause of osteo-arthritis. The speaker believed that it was an important contributory factor, but there must be a predisposing cause. He would call attention to the very rare condition of alkaptonuria. In those cases associated with ochronosis the cartilages of the ear became stiff and black. These patients showed a very special liability to develop osteo-arthritis. Two German observers had described a family with an alkaptonuric father. Four of the children

suffered from ochronosis and osteo-arthritis; the other four escaped both troubles. There was therefore strong evidence of a special predisposition to the disease. He was tempted to ask, What was rheumatoid arthritis? It was apparently an infective malady; but was it due to one specific infective agent, or was it a disease, like malignant endocarditis, which might be due to a variety of organisms? Sometimes one could find an infective focus, often suppuration around teeth, and removing the focus might lead to the recovery of the patient. But in the majority of cases, search how one would, no definite infective focus could be found. The cases of this type were very many.

Experience had led Sir Archibald Garrod to think that there was a specific disease closely simulated by diseases due to other causes. Such were the arthritis of bacillary dysentery, gonorrhoeal arthritis, and the arthropathy of psoriasis. He well remembered a girl under his care years ago at St. Bartholomew's Hospital. She was a public singer and dancer and suffered severely from psoriasis, with arthritis of many joints. She was apparently completely crippled with rheumatoid arthritis. Under arsenic (also convenient because she suffered also from that curious condition, intermittent hydrarthrosis) she showed great improvement. The psoriasis went away and with it the joints improved. She was able to sing and dance again. Unfortunately the condition recurred. He thought that in this condition there was a perfectly distinct lesion waiting to be investigated. Drugs he did not consider of much value in rheumatoid arthritis. Vaccines were of prophylactic value, but he had never seen recovery follow vaccine treatment alone.

Protein shock gave great relief to patients at the time, but he doubted if the effect was lasting. Treatment at watering-places was valuable later when the subacute stages had subsided and before deformities were established. The same applied to massage of the muscles. Their aim should be to kill off the infection before it did its irrevocable damage to the joints. In osteo-arthritis also drugs were not of much value. He thought that iodides with arsenic sometimes did good to patients just beginning with Heberden's nodes. In hip cases drugs were no good at all. Watering-places with massage and electrical treatment sometimes helped. If he could direct the discussion at all, he would like to ask—

1. What is the difference between osteo-arthritis and rheumatoid arthritis?
2. Is rheumatoid arthritis due to a specific infection or not?
3. What is the real value of modern bacterial knowledge applied to these conditions?
4. What can be done for the patient?

Dr. M. CASSIDY feared that the few remarks he would have to make might be regarded as being agnostic or even reactionary. He would begin by expressing his profound conviction that the importance of infective conditions in the etiology of these diseases was at the present time grossly overrated. Particularly was this the case with rheumatoid arthritis. He regarded rheumatoid arthritis as a clinical entity—a somewhat uncommon disease, and one almost entirely confined to women, whom it attacked in early life. In his opinion it was uncommon to find any septic focus, however carefully it was looked for, in a genuine case of rheumatoid arthritis. As a rule these patients had perfect teeth, there was no evidence of intestinal toxaemia, the urine was sterile, and the respiratory tract, tonsils, ears, and genitalia appeared healthy. The fluid aspirated from the joints was invariably sterile; sterile also, he believed, was the synovial membrane itself. Nine years ago Mr. Percy Sargent and he scanned microscopically and bacteriologically small fragments of synovial membrane removed during life from rheumatoid joints. In only one out of fifteen cases was an organism (a streptococcus) recovered, though cultures were made from the excised synovial membrane aerobically and anaerobically in all the usual media. He suspected that their one positive result was a skin contamination. He confessed to being a little sceptical as to whether rheumatoid arthritis was infective at all. There was little in its clinical aspect, apart from the occasional pyrexia, to suggest an infective process. It might run a steady progressive course, with remissions and exacerbations, of thirty or fifty years, with never a visceral complication. Pleurisy, pericarditis, and endocarditis occurred very seldom, and then probably accidentally. The only really common complication was fibrositis, and he was satisfied that not only was there a definite tendency to heredity in rheumatoid arthritis but also that relatives of those patients were specially liable to fibrositis. He often wondered if both conditions were not metabolic rather than infective, and wished that the biochemists might tear themselves away, if only for a few months, from tests of renal function and blood sugar curves and devote themselves to reinvestigating the metabolism of gout, rheumatoid arthritis, and fibrositis. All that he had said referred to genuine rheumatoid arthritis, the disease as described, for instance, in Allbutt's *System* sixteen years ago by the distinguished opener of the debate. He freely admitted that there was a large group of cases of chronic infective arthritis which might resemble sometimes very closely rheumatoid arthritis at some particular stage in the disease, but rarely throughout its course. In this group an infective focus was often readily demonstrable and its removal often led to cure. But it had been his misfortune to see many cases of rheumatoid arthritis lose all their teeth, submit to a long course of inoculations, and never in his experience was the course of the disease arrested by these measures. What he had said of rheumatoid arthritis held good for many cases of osteo-arthritis. Some cases of this condition were infective, but there were other causes besides infection. Personally he believed that some osteo-arthritic joints were primarily gouty although they had never been attacked by typical acute gout. He remembered two sisters with subcutaneous nodules along the exterior tendons of the hands and feet. Mr. Max Page excised some of these nodules; they contained much uric acid. At the present time both of these sisters were developing osteo-arthritic changes in the knees and other joints. He found it difficult to believe that these conditions were not of gouty origin, though there had never been anything readily resembling acute gout. They were all familiar with the acute onset of osteo-arthritis of the knees, with or without the simultaneous appearance of Heberden's nodes in the fingers, in many women at the time of the climacteric. Surely that must be metabolic rather than infective. Yet these patients, like so many arthritics at the present time, were doomed to become edentulous, and probably also to suffer inoculations.

Dr. F. J. POYNTON said that just over twenty years had elapsed since, with Dr. Paine, he had demonstrated the experimental production of osteo-arthritis with a streptococcus obtained from a knee-joint, damaged by osteo-arthritis, of a patient who died by misadventure from carbolic acid poisoning. He thought that since then the importance of infection in these diseases had been more and more recognized. They had shown later two other experimental results: (1) that the same infection in varying virulence might produce various types of arthritis; (2) that a monarticular arthritis might arise from a blood infection. There still remained the difficulty of deciding whether there was a particular disease rheumatoid arthritis or whether it might arise from various infections. It was tempting to believe that just as a particular streptococcus might produce acute rheumatism so a particular staphylococcus might produce rheumatoid arthritis; but whether in human disease any line could be drawn between streptococci and staphylococci was to him doubtful. The various changes in the joints he looked upon as of great practical importance, but as secondary incidents connected as to the prime cause and not in themselves specific. His experience inclined him to believe that the disease was more under control than formerly, and this he attributed in part to the recognition of infection and local foci. The term "local focus," now so often heard, was a fundamental conception, but was dangerous in its simplicity. Very attractive, because sometimes true, was the picture of such a focus discharging infective agents into the system and another showing a cure after removal. The problem in rheumatoid arthritis was unfortunately much more complex and involved one in the great and difficult questions of the behaviour of infections within the body, of the methods of resistance of the body to infection, and the influence of outside factors on the resistance. Could, for example, an apical abscess at the fang of a tooth produce rheumatoid arthritis when it was an almost solitary lesion? How were they to explain the fact that after a septic mouth had been thoroughly cleansed a rheumatoid arthritis might continue uninfluenced for years? Either the septic mouth was only an incident, or, if the cause, secondary foci within the body had taken on an active phase. Lack of knowledge of the life history of infection in the body was the obstacle now in the treatment of the disease. It was quite possible to keep removing local foci in a patient who could ill bear the strain of active measures and later to discover that the activity of the process was dependent upon factors within the body itself. Unhealthy foci should certainly be

treated, but if we held to the crude idea of a local focus as the explanation of rheumatoid arthritis he thought that cases, of which there were many, in which no foci were apparent might suffer from spasmodic efforts for the removal of suspected foci. Dr. Poynton thought that vaccine treatment was indicated when a micrococcus was isolated in pure or almost pure culture from an obvious local focus, but he thought it would be helpful if a new aphorism could be added to medical literature. It was this: Many cases of rheumatoid arthritis show no definite local focus, but there is no case of rheumatoid arthritis from which a micrococcus cannot be isolated. Did a vaccine isolated from the tonsil, the faeces, the urine, or the nose do service when there were no local signs of disease in these situations? He believed that auto-intoxication from the bowel was the most popular theory of the causation of rheumatoid arthritis. He would treat with care all bowel complaints as they arose, but not from the conviction that they were the cause, but rather the result of the infection. He laid much stress on the treatment of the nervous system. Organotherapy was indicated in cases at the menopause and in cases with severe vasomotor symptoms, but its value difficult to appraise. He had always leaned to curtailing carbohydrates, but Pemberton and his school had carried this line of treatment to considerable lengths, and it was possible we should learn more of the influence of control feeding upon resistance to infection. Local measures were legion. He did not advise radiant heat in cases which were worse in the summer time. He had often noticed relief in hypertrophic arthritis from ionization. His experience of osteo-arthritis of the hip accorded with that of others in the frequency of injury as a factor. In the earlier stages treatment on the lines of tuberculous hip disease seemed to him the most promising. Often these patients, athletic and intolerant, would not wear a splint. Treatment at a spa might do good in these cases provided that the joint could be rested.

Dr. A. F. HURST called attention to two very constant symptoms of rheumatoid arthritis. There was, during the acuter phases, sweating from the palms of the hands and from the feet; there was an increased pulse rate. He thought that the prognosis was better than some would have them believe. In every case there were infective foci, although often they were difficult to find. He thoroughly believed in the value of x rays in the diagnosis of foci connected with teeth. He cited a case in which a medical student suffered very severely from rheumatoid arthritis. It was thought that he would be crippled for life. At first no lesion of the teeth was discovered. He was sent back to the dentist, and finally a very slight change was detected in one tooth. This was removed. There was a violent reaction. Vaccines were made from the tooth and given to the patient. Again there was a violent reaction. More teeth were removed. The patient was now quite well, and was present that evening. After teeth, tonsils. Many normal-looking tonsils were the seat of infection, but intestine must not be forgotten. Often these cases suffered from achlorhydria, and in these cases large doses of dilute hydrochloric acid did good. Several times Einhorn's tubes had given him organisms from the duodenum, from which it had been worth while to prepare vaccines. While the arthritis was acute, and the joint tender and painful, the affected parts ought to be fixed. Deformity could be prevented by keeping the joints in good position. His treatment was a combination of rest and removal of foci. After the active disease had died out complete ankylosis was rare. Yet often patients remained bedridden. For these, treatment by orthopaedics and psychotherapy was often the best thing. Persuasion, explanation, re-education —all three were necessary. A large proportion of these helpless cripples could, if they would, take up their bed and walk.

Dr. T. S. P. STRANGEWAYS demonstrated pathological specimens to show that there were at least six types of arthritis at present included under the name "rheumatoid arthritis." In order to avoid new names he had provisionally classified these types as follows: (1) capsular, (2) dry, (3) adhesive, (4) rarefying, (5) villous, (6) infective.

In the *Capsular type* the joint changes were practically confined to the capsule of the affected joint. The synovial membrane was not much altered. The capsule itself showed some degree of thickening and fibrosis. The articular cartilage, as a rule, appeared normal, but in the later stages of the disease it might show atrophy over areas of pressure. The bones of the articulation were normal. This type might be found in both sexes, but was more common in the female sex. The patient complained of loss of strength and a feeling of slackness. The joints were swollen, and on movement were stiff and painful, and often there was a leather-like creaking. Apparent recovery, or great improvement in the symptoms, might take place within a few months of the onset, but a relapse nearly always followed within a longer or shorter period. Although complete recovery might occur, the patient, as a rule, gradually became more and more helpless and crippled.

In the joints of the *Dry type* the characteristic change was the absorption of the synovial fluid which in the later stage of the disease was completely absent. The capsule became atrophied, fibrous, and tightly contracted, gripping the bones of the articulation firmly, and thus causing the articular surfaces to lie in close contact with each other. The synovial membrane was dry and had the appearance of parchment. The cartilage was atrophied from pressure. The bones of the articulation were not altered. This type was seen more commonly in the female sex, and in its early stages it was sometimes diagnosed as chronic rheumatism or fibrositis. There was no swelling of the joints, but as the disease progressed movement became more and more difficult and eventually impossible, and this often led to a mistaken diagnosis of "bony ankylosis." In spite of the close contact, true adhesions between the joint surfaces did not take place, but if the joint was opened the articular surfaces would be found stuck together so that some force was required to separate them.

The *Adhesive type* began with inflammatory changes in the synovial membrane and capsule. These changes were associated with the formation of a vascular granulation tissue which spread over the cartilage and became adherent to it, thus causing vascularization of the perichondrium and of the deeper layers of the cartilage. This was followed by the erosion and replacement of the cartilage by a vascular inflammatory connective tissue which later invaded parts of the calcified cartilage and the bone underlying it. As this inflammatory process spread, vascular adhesions were formed in the joints between adjacent articular surfaces. This acute condition of the joint might persist for months or years, but eventually tended to subside. The inflamed capsule and synovial membrane, together with the newly formed connective tissue and adhesions, gradually became less vascular and eventually were replaced by firm fibrous scar tissue in which development of new bone might occur, leading to bony ankylosis. This type appeared to be confined to the female sex. The patients were thin and wasted, and several joints were usually attacked. They complained of intense pain on movement, but apart from the joint conditions were not in bad health. After several years the disease usually became quiescent, but the patient remained permanently crippled owing to the joint changes.

In the *Atrophic type* the bones in the affected joint were greatly rarefied, and eventually the cancellous tissue was practically replaced by pure fat, so that the bone cut readily with a knife. Accumulation of fat was also present in the muscles and other tissues of the limb, which in extreme cases became so friable and fatty that on forcible extension they broke like a carrot. The capsule, synovial membrane, and articular cartilage were atrophied. In the smaller joints atrophy of the bones might be extreme, especially in the joints of the hands when they had been used, in spite of the joint changes. The carpi were fused together, and after maceration had a lace-work appearance resembling that of white coral. In the early stages inflammatory changes took place in the capsule, and as these subsided bony ankylosis of the larger joints often occurred. In the late stages of the disease the atrophy of the limbs, especially of the hands, was a marked feature. This type appeared to be confined to the female sex, and the patients were usually well nourished and cheerful. There might be a history of exposure, such as sleeping in a damp bed or sitting in a cold train when wet through.

The *Villous type* was seen in both male and female patients, who complained of the joints feeling weak and somewhat painful on movement. There was considerable swelling of the affected joints, which felt soft and full of fluid. Although some increase of synovial fluid might be present the swelling was chiefly due to the presence of a number of larger or smaller pedunculated villi, which might be so numerous that the whole of the synovial membrane was covered with them. On opening the joint these villi appeared as soft, velvety, pinkish outgrowths, and in some cases, especially where the pedicle was long, they were deeply congested. It was in this type that "joint mice" or melon-seed bodies were found lying in the joint cavity. As a rule only the larger joints were involved and the condition seemed to be due to

formation of warty growths of vascular polypi on the synovial membrane. The cartilage was not much altered, but might show signs of atrophy. The bones of the articulation were normal.

The *Infective type* included a group of cases which were usually diagnosed as rheumatoid arthritis, but in which the arthritis was due to some definite micro-organism. A careful inquiry into the history and a study of the cases would occasionally make it possible to determine the type of micro-organism to which the arthritis was due, but more often it was impossible to arrive at a definite diagnosis. Examples of this type were those obscure forms of chronic arthritis due to the gonococcus, pneumococcus, or various types of dysenteric bacilli, and most observers would include streptococci and staphylococci, but he was doubtful if these two latter organisms were so common a cause of chronic arthritis as was usually thought. Clinically the condition might resemble the adhesive type, but a careful inquiry into the history of onset and progress of the disease, together with a study of the clinical symptoms, usually made it possible to give a provisional diagnosis of infection. This type would, of course, drop out of the above classification when methods of diagnosis improved.

Dr. J. A. GLOVER of the Ministry of Health presented the meeting with some very interesting figures, the results of the inquiry instituted in 1921 by direction of the chief medical officer to look into the large amount of morbidity amongst insured persons ascribed to "rheumatism." In this inquiry a number of insurance practitioners in various parts of the country rendered most valuable aid. By their help it was possible to keep a sample population of 90,000 insured persons under review during 1922. It was also decided as a separate inquiry to ask the regional medical officers of the Ministry to record every case of rheumatic disease referred to them. Diseases were classified under nine heads, of which osteo-arthritis and rheumatoid arthritis were two. Standards of comparison were arranged. The following table gives the incidence of the condition.

	33 Regional Medical Officers, examining 27,805 male and 39,630 female patients with all diseases, reported in 1922 the following cases:		19 Insurance Practitioners of 44 practices, representing a panel of 90,891 (57,998 males, 32,893 females), reported in 1922:	
	Males.	Females.	Males.	Females.
Rheumatoid arthritis ...	364	805	83	97
Osteo-arthritis	640	623	119	71
Gout	88	23	150	3
Chronic joint changes (unclassifiable)	23	43	50	20
Total	1,120	1,494	432	191
Percentage of all rheumatic cases	44	53	24	26

Mr. Glover showed a number of most interesting diagrams illustrating these and other figures. The usual idea that the female liability to rheumatoid arthritis was at least three times greater than the male was, on the whole, borne out by Dr. Glover's figures. He made an interesting point in demonstrating the heavy osteo-arthritis attack rates, as regards males, in the north-west (Lancashire division) and the heavy gout incidence in the same sex in the south-west and the south-east. In females the south-east showed a very high rheumatoid arthritis incidence.

GLANDULAR FEVER AND INFECTIVE MONONUCLEOSIS.

AT the meeting of the Section of Medicine of the Royal Society of Medicine on April 24th Dr. H. LETHEBY TIDY discussed the possible identity of glandular fever and infective mononucleosis. Dr. Tidy said that glandular fever was an acute infectious disease, principally occurring in childhood and characterized by enlargement of the cervical glands, which, however, were not painful in spite of their size. A child of 6 or 7 years might have several discrete glands almost the size of an egg. The temperature rose with the enlarging of the glands, and generally reached about 103° F., falling as the enlargement subsided. Suppuration was extremely rare, and, when it occurred, was probably due to secondary infection. The only serious complication was haemorrhagic nephritis. Convalescence was slow, but recovery was almost invariable, and the mortality might be said to be negligible. During the last two years a number of papers had been published on infective mononucleosis, in which condition there was said to be a high percentage of lymphocytes, even as much as 95 per cent. in a total count of 23,000. The clinical description of these cases of infective mononucleosis was indistinguishable from that just given of glandular fever. In 1921 the speaker, with Dr. Morley, having a case of glandular fever, took a blood count; he could not find any record of a blood count having been taken previously in such a case. The result showed 84 per cent. of lymphocytes in a count of 15,000.

Dr. Tidy had had the opportunity also of observing an epidemic of glandular fever in a school at Epsom, where 24 out of 42 boys reported sick with large glands in the neck and sore throat. In none of these cases did the temperature rise above 103°, and in only three cases above 102°. In no case was there suppuration, and in only one case was the spleen enlarged. The fauces were reddened in a good many of the cases and the tonsils enlarged. Some difficulty was experienced in taking blood tests owing to the fear lest it should be thought that the boys were being experimented on, but blood counts were actually taken in 18 cases, and the results, which he showed to the Section, suggested that an absolute lymphocytosis was a general though not an invariable occurrence in glandular fever, but the lymphocytosis might be very transient, very slow of development, and not always present at the onset of the illness. He believed that glandular fever was a clinical entity, and he emphasized in this connexion the size of the glands and the small changes in the fauces compared with the glandular enlargement. The clinical picture of glandular fever was quite characteristic, and sufficient for diagnosis and prognosis. He believed also that glandular fever and infective mononucleosis were clinically identical.

As for associated conditions, Dr. Tidy continued, whooping-cough might be ruled out, because many of the children concerned had whooping-cough before and since the attack; the same argument applied to mumps. With regard to acute leukaemia, it was quite definite that leukaemia was not infectious; an epidemic of leukaemia had never been heard of. He imagined also that it would be possible to distinguish between the blood changes in acute leukaemia and in this condition. The diagnosis from acute leukaemia was easy, and more usually the medical man who saw a case of glandular fever was inclined to put it down to mumps. Another condition for which it was sometimes mistaken was acute tuberculous adenitis; this mistaken diagnosis might have serious consequences for a youth. As to possible confusion with tonsillitis, the changes in the fauces in glandular fever were characteristically very slight, especially so when compared with the marked involvement of the glands.

Osteo-arthritis of the Spine.

Dr. CLAUDE GOULDESBROUGH discussed osteo-arthritis of the spine, particularly from the radiological point of view. He commented upon the number of cases sent down with a provisional diagnosis of renal calculus which showed no signs of calculus on examination, but did show osteo-arthritis of the spine. In one year, out of 196 cases collected from the wards and out-patient department of St. Thomas's, all of them with a provisional diagnosis of renal calculus, such calculi were found to be present only in 19, while among the remainder 17 showed osteo-arthritis of the spine. Thus there were nearly as many osteo-arthritic spines as cases of calculus. He discussed osteo arthritic spines in three categories—two completely distinct from each other, and the third a combination of the other two. The first and most common was distinguished by a spikiness or buttressing of the vertebrae, the region most commonly attacked being the dorsal; the second was distinguished by no extraneous deposits, and showed simply erosion of the discs, affecting the lumbar region. He showed a number of radiographs and drew attention to the excess shadow beyond the outline of the true vertebrae in the first type. The definite edge of the vertebrae was clearly seen, and beyond this the overlying fibrocytic condition.

NON-OBSTRUCTIVE JAUNDICE.

A MEETING of the Liverpool Medical Institution was held on April 12th, with the President, Professor J. HILL ABRAM, in the chair, when Professor R. J. M. BUCHANAN introduced a discussion on non-obstructive jaundice.

He considered that the distinction should be between jaundice without gross obstructive lesion and jaundice from other causes. He held that the condition was always due, in the last event, to obstruction to the biliary secretion, even in cases where the cause was due to an inflammatory condition of the liver. Professor Buchanan reviewed the differential diagnosis and discussed the value of the Cammidge reaction and of the chemical test introduced by van den Bergh. He discussed the difficulty that arose in the diagnosis between jaundice that was purely haemolytic in origin and forms in which there was some functional derangement in the hepatic cells.

Dr. E. CRONIN LOWE said that jaundice was a symptom arising from derangement of hepatic function from many causes. Among the most common was infection of intestinal origin, the infection proceeding by way of the portal circulation. Mild jaundice could also be demonstrated in the early stages of many infections which were not portal. Van den Bergh's test should prove of value in distinguishing between gross obstruction and catarrhal cellular hepatitis. He had not found absence of post-prandial leucocytosis reliable as an indication of hepatic deficiency. All cases of jaundice without gross obstruction required extensive investigation, which included examination of the gastric, intestinal, and urinary secretions, and also of the blood. When jaundice was traceable to portal infection treatment by a vaccine was of considerable value.

Dr. H. PEMBERTON said that apart from a grossly obstructive type of jaundice which showed acholic stools, bile pigments always in the urine, and an excess of bilirubin (giving the direct van den Bergh reaction), as well as of bile salts in the blood, there was another group to which the term "non-obstructive" had been loosely applied. In this group bile derivatives might be normal or in excess in the faeces, bile pigments might be absent from the urine, but urobilin was often present and in the blood there was a form of bilirubin which gave the indirect van den Bergh reaction, but usually no bile salts. Among the many types which comprised this latter group a subdivision seemed possible into a type presenting mainly haemolytic features and a type presenting mainly primary hepatic inefficiency often. In the differential diagnosis of these types splenic enlargement increased fragility of erythrocytes and urobilinuria often contrasted the first type with the second, in which laevulose estimation in the blood after a test meal might show the abnormal curve of liver inefficiency. As a diagnostic test van den Bergh's reaction did not seem of much value in this matter.

Dr. GORDON GULLAN had seen a typical case of nervous jaundice occurring in a student every time he went up for an examination; the jaundice was very deep and lasted for four or five weeks. Dr. Gullan referred to cases of Hanot's cirrhosis, in which, as well as the jaundice and the great enlargement of the liver, haemorrhages were present under the skin and the mucous membranes; in these cases some bile was also found in the stools.

Cases.

Dr. J. R. LOGAN read a note on an unusual mineral deposit in the soft tissues of the hands, and showed *x*-ray photographs.

The patient was a female, aged 60, suffering from a mild degree of Raynaud's disease. The hands and feet were always cold, the former often of dusky-blue colour; dilated veins were visible on the face, ears, and tongue. The mineral deposit was not found in the toes. There were many nodules on the sides and palmar surfaces of fingers and thumbs, in the subcutaneous tissue, not specially near joints. Analysis showed that there was no trace of uric acid, and that the substance giving the dense shadows was phosphate and carbonate of lime.

Mr. ARTHUR EVANS read a note on a case of fracture dislocation of the fourth cervical vertebra.

The patient was admitted to the Southport Infirmary under the care of Dr. Reinhardt Anderson, having fallen from a motor lorry. The injury was followed by definite paresis of both upper and lower limbs with sensory phenomena indicating a lesion of the fifth cervical segment of the cord. There was definite tenderness over the region of the fourth cervical spine. A radiograph showed a well marked fracture dislocation forward of the fourth cervical vertebra upon the fifth below. Expectant treatment was carried out for a short period, but the patient's condition soon became stationary. He was operated on six weeks from the date of the accident, laminectomy being performed, the spines and laminae of the third, fourth, and fifth cervical vertebrae being removed. The cord at the level of the dislocation was found to be grooved and indented in its entire circumference by the laminae of the fractured vertebra behind and in front by the "angulation" produced by the body of the vertebra below the dislocation. The patient made a steady and rapid recovery. Twelve months from the date of his injury he was able to resume his ordinary employment as a mechanic in a motor factory, an occupation requiring not only considerable muscular strength but unusual deftness of the hands and arms.

METASTASIS IN MUMPS.

AT a meeting of the Brighton and Sussex Medico-Chirurgical Society held on April 5th, with Mr. A. J. HUTCHISON, President, in the chair, Mr. GEORGE MORGAN read a paper on metastasis in mumps. He gave details of the illness of a boy, aged 14, who, during an epidemic of mumps at his school, developed a right parotitis, followed by arthritis of the right knee, delirium, and urticaria. Subsequently he had acute pericarditis with endocarditis, and the urine boiled almost solid, although no casts were found. Next he had symptoms of mitral regurgitation and a right-sided pleurisy, with morbilliform rash and pain and swelling of the right ankle and an enlarged gland in the right axilla. Jaundice supervened with a temperature and pulse rate continuously high, the pericardial friction and the regurgitant mitral murmur still being manifest. Severe pain and tenderness over the abdomen suggested the possibility of acute pancreatitis, and both knees developed an acute arthritis. Blood cultures were sterile. After a prolonged convalescence the boy made a good recovery.

Mr. Morgan also quoted the case of a man of 26 who, while playing billiards, was accidentally struck by the cue on the left testicle. The organ rapidly swelled up and became very painful and tender, and a few days later the left parotid enlarged and the swelling of the testis became reduced. He then had symptoms of meningitis, with severe headache, vomiting, and photophobia. He was very ill indeed, but ultimately made a good recovery. Mr. Morgan thought that possibly the virus of mumps was in the blood at the time, and that the injury caused it to attack the testicle before the parotid.

The PRESIDENT, Drs. HALL, NEVILLE COX, ALLEN, LIVINGSTONE, and SIMPSON took part in the general discussion which followed, and Dr. MORGAN replied.

Urological Diagnosis.

Mr. M. FITZMAURICE-KELLY, in a paper on diagnosis in urinary diseases, remarked that a revolution had occurred in surgical urology in the last twenty-five years, due to the new methods of diagnosis which had been introduced and perfected during that time. These methods were chiefly endoscopic, but radiology and chemical physiology had also contributed to the advance. The chief methods employed were discussed in their relation to the main symptoms of urinary disease, and the importance of a diagnosis, as accurate and complete as possible, before treatment was undertaken, was insisted upon. The speaker entered a strong plea for the more careful and thorough treatment of stricture, aided by the information which could be obtained by the urethroscope. In enlargement of the prostate, the importance of a quantitative diagnosis, with special regard to the intravesical enlargement, was urged, and the diagnosis of post-operative obstruction was discussed. With regard to haematuria, Mr. Fitzmaurice-Kelly emphasized the urgency of cystoscopic examination while bleeding was occurring (so that the opportunity of making the diagnosis should not be lost) and the uncertainty of any inference not based on direct observation. Tests of renal function were of great importance in two classes of cases—those, such as enlarged prostate, where the total efficiency was in question, and those in which nephrectomy was contemplated, and the functional value of the presumably healthy kidney had to be ascertained. The speaker expressed a preference for the urea concentration test in the former class, reinforced by the blood urea test in certain cases; in the latter class, especially where operation was necessary to save life, colour tests, used simply as time tests, were of value.

The PRESIDENT, and Drs. FIELDEN, MORGAN, SIMPSON, ORLEBAR, and HALL spoke, and Mr. FITZMAURICE-KELLY replied.

OCCIPITO-POSTERIOR POSITIONS.

AT a meeting of the Manchester Medical Society on April 11th, with Sir WILLIAM MILLIGAN (President) in the chair, Dr. DANIEL DOUGAL, in a paper on the diagnosis and management of occipito-posterior positions of the vertex, described the condition as the most frequent complication met with in obstetrics, and suggested that it was responsible for more damage to mother and child than any other single complication. A diagnosis was practically always possible as the result of abdominal palpation, a method of examination to which far too little attention was paid even at the present time; in fact, vaginal examination, he believed, was still chiefly relied upon for the recognition of obstetric difficulties, and the abdominal method was practised in a very perfunctory fashion, if at all. He thought that the left lateral position of the patient was partly responsible for this, as the abdomen was not readily accessible for examination unless the patient was turned over on to her back, and, rather than disturb her, many were content to neglect the method altogether. In the great majority of occipito-posterior cases it was quite easy to feel the child's limbs occupying the front of the abdomen and the narrow plane of the back lying well out towards one or other flank. On vaginal examination an attempt should be made to recognize the sutures and fontanelles and to ascertain the direction of the pinna of the child's ear. In any case of doubt the patient should be anaesthetized and the whole hand passed into the vagina.

As regards treatment, Dr. Dougal restricted his remarks almost entirely to the following three main lines:—(1) Preventive: Cases seen during pregnancy or early in labour should, he said, be corrected by using the padded binder recommended by Buist (BRITISH MEDICAL JOURNAL, November 12th, 1921, p. 782), or by external manual rotation. (2) Expectant: Where preventive methods were inapplicable or unsuccessful Nature should be given a reasonable time to correct the malposition, and this she would do in 80 to 90 per cent. of cases if there was no interference with her. The condition of the mother and child and the progress of the case generally would decide how long this method was to be continued. It was frequently possible to observe the progress of rotation by inspecting the position of the child's anterior shoulder from time to time. (3) Operative: When previous methods proved unsuccessful the child's head should be rotated bimanually and delivery completed with forceps. It was often an advantage actually to rotate the child's anterior shoulder by placing two fingers of the internal hand behind it. Manual rotation might fail if the head had descended low into the cavity of the pelvis, and then it was worth trying to rotate with the forceps. Lamond Lackie of Edinburgh favoured this method in such cases, but laid stress on the importance of not applying traction until rotation had been completed with the forceps and the latter removed and reapplied. Dr. Dougal believed that it was rarely necessary to attempt extraction with the occiput posterior, and yet a very large number of cases were still treated in that way. It was a common occurrence, in his experience, for many of these cases to be admitted to St. Mary's Hospital after unsuccessful attempts at forceps extraction, the maternal soft parts being seriously lacerated and the children often fatally injured. Rotation and subsequent delivery with forceps were usually carried out with such ease that it must be concluded that the method had not been previously attempted. The reason was to be looked for in faulty methods of examination and failure to recognize the malposition as the true cause of difficulty.

ETIOLOGY OF TUMOURS.

AT a meeting of the Royal Medico-Chirurgical Society of Glasgow held on April 20th Mr. JOHN PATRICK and Dr. J. A. G. BURTON demonstrated four cases illustrating—(1) trauma as a factor in the etiology of sarcoma, (2) the transformation of chondroma and granuloma into sarcoma.

The first case was that of a young miner who sustained a blow on the fronto-parietal region, the resulting effused mass being discovered to be a round-celled sarcoma which had formed in six weeks from the time of injury. The same patient had suffered osteomyelitis of the tibia with formation of granulomata in the skin around the bone wound. These were proved on three examinations to be simple granulomata; after treatment by *x* rays one of the tumours became altered in appearance, and on microscopic examination was found to be sarcoma.

The second case was that of a boy who had for twelve years suffered from a warty growth on the back of the hand. This was removed by carbon dioxide snow, and three months later a definite subcutaneous tumour was found which was proved to be a spindle-celled sarcoma. There was also in this case sarcomatous infection of the axillary glands.

The third case was that of a lad who suffered from a tumour of the head of the tibia, which was regarded clinically as sarcoma. Examination on two occasions by microscopic section showed this to be a chondroma. The tumour was extirpated, but growth again took place, and the growth was on this occasion discovered to be a spindle-celled sarcoma.

The fourth case demonstrated was that of a boy of 10 years, who exhibited a swelling in the lower end of the femur, which clinically would be regarded as a sarcoma, but which, when a portion was removed for microscopic examination, was discovered to be a myxo-chondroma. The case was exhibited to the Society as one which would require careful examination from time to time lest sarcoma should develop.

Mr. G. H. EDINGTON made a short communication on exostoses of the long bones. Spongy exostosis, while a well known condition, was, comparatively speaking, infrequent; cases resolved themselves into two categories—the solitary and the multiple exostoses, concerning the latter of which there were frequent mentions in surgical literature. The structure of cancellous exostosis was described and its situation on the affected bone. As regards its origin, he referred to Keith's views on the nature of multiple exostoses—namely, that there is a growth-defect of the membrane enveloping the cartilaginous forerunner of the future bone. The cause of this defect is possibly a disturbance in function of the thyroid gland. Mr. Edington thought that localized defect of membrane might be invoked as the cause of solitary exostosis. He then referred to the clinical manifestations presented by individual cases—namely, deformity, hindrance of function, injury from without, and bursitis—and briefly mentioned the operative treatment of the condition. The communication was illustrated by skiagraphic and photographic lantern slides of cases which he had had under observation.

Diverticulum of the Bladder.

Mr. J. MILL RENTON made a short communication on a case of diverticulum of the bladder, and showed the specimen. The patient was a man aged 53, whose urinary trouble followed the spraining of an ankle eight months previously. The bladder on examination reached the umbilicus, and there was no enlargement of the prostate per rectum, but there was obstruction to the passage of the instrument about the neck of the bladder. The urine was highly infected. On opening suprapubically an opening behind the left ureter was found which just admitted the forefinger upwards and downwards in front of the rectum. This diverticulum was separated by blunt dissection, and the neck divided and sutured from the outside of the bladder. Recovery was complete. Mr. Renton made remarks upon previous observations on such conditions, and commented upon the value of cystoscopy. The speaker referred shortly to the operative treatment (1) through the bladder, (2) through the peritoneum, and (3) outside the peritoneum.

Dr. H. E. JONES made a communication on "Glycosuria: a theory of its cause." He described his observations on the activities of the "Californian bees" (also known as the ginger-beer plant), and offered a theory as to the cause of glycosuria.

A MEETING of the Section of Obstetrics of the Royal Academy of Medicine in Ireland was held on April 13th, with the President, Dr. BETHEL SOLOMONS, in the chair. Dr. L. CASSIDY showed a specimen of fibroma of the ovary, removed from a woman aged 54, who had had five children, and whose menopause had taken place eight years previously. Dr. SOLOMONS said that fibromata were found in about 2½ per cent. only of all solid tumours of the ovary. The PRESIDENT showed a specimen of adenomyoma of the uterus, removed from a woman aged 38, who had been married six years and was sterile. At a previous operation a growth the size of a grape fruit, which grew from the left cornu of the uterus and was apparently an adenomyoma, was removed; the uterus was left as the woman was most anxious to become pregnant. She did not become pregnant, and at the second operation an obviously fibroid uterus was found, which was removed with tubes and ovaries, a very small piece of the cervix being left. After operation the patient still complained of pain, and as palpation of the cervical stump caused pain this was removed vaginally. There was no adenomyoma in the cervix, but histological examination of the body tumour showed typical adenomyoma uteri. The case was discussed by Dr. J. S. QUINN and Dr. G. TIERNEY. Dr. GIBBON FITZGIBBON then read the report of the Rotunda Hospital, which was discussed by Dr. L. L. CASSIDY, Dr. TOTTENHAM, Dr. R. J. ROWLETTE, and the PRESIDENT.

BRITISH CONGRESS OF OBSTETRICS AND GYNAECOLOGY.

MEETING IN EDINBURGH.

(*Concluded from page 725.*)

THE morning and afternoon sessions on the second day, Friday, April 20th, were devoted to short papers and demonstration of specimens. The chair was occupied by Dr. HERBERT SPENCER.

X Rays in Inoperable Cancer.

Dr. HERBERT SPENCER described two cases of cancer of the body of the uterus with secondary growths in the vulva and vagina, which remain free from recurrence five years and four years respectively after hysterectomy and treatment by *x* rays and radium.

Case 1.—A parous widow, aged 62, with cancer of vulva and annular stricture of the vagina preventing examination of the uterus. The left vulva and inguinal glands (which were healthy) were excised, and the vagina dilated. The growth was found to be a papillary carcinoma of the uterus; cervix fixed (inflammatory). Radium emanation (108 mg.) was applied to the cavity of the uterus for twenty-four hours; abdominal hysterectomy six weeks later; *x* rays to abdomen and vulva. No recurrence after five years.

Case 2.—A nulligravida, aged 56, with extensive cancer (adenocarcinoma) of the body of the uterus. Vaginal hysterectomy was performed with galvano cautery. Four months later an ulcerated growth recurred in the anterior vaginal wall, which was deemed inoperable. Radium emanation (100 mg.) was applied. The growth completely disappeared within three months, and there was no recurrence after four years.

Chorion Epithelioma of the Fallopian Tube.

Drs. BETHEL SOLOMONS and E. C. SMITH described a case of primary chorion epithelioma of the Fallopian tube. The patient, aged 40, had been married seventeen years and had eight healthy children, the youngest aged 3 years; there had been no abortions. She was admitted to hospital because of continuous haemorrhage since her last period, which had started three weeks before admission. On the anterior vaginal wall, two inches from the vulva, was a tumour the size of a hazel nut, which proved on removal to be a chorion epithelioma. Laparotomy was performed, and a tumour of the same nature as the vaginal growth was found close to the left cornu of the uterus. The whole uterus and adnexa were removed, but two months after operation the patient developed secondary growths in the lungs, and died. The source of the growth it was impossible to ascertain; the patient had never missed a period, and the corpus luteum was that of menstruation.

Chorion Angioma.

Dr. GILBERT STRACHAN showed a specimen of placental chorion angioma. The obstetrical history was unimportant, and the condition was only discovered on examination of the placenta. The tumour was situated at one side of the placenta, was 2½ inches in diameter, and protruded on the amniotic surface. The uterine surface was not involved. Microscopically it consisted of a number of irregular large spaces filled with blood, and with a myxomatous fibrous tissue between. Dr. Strachan expressed the view that local congestion or inflammation could not explain the condition, and that it represented a purely neoplastic formation.

Dr. R. W. JOHNSTONE showed lantern slides of a similar case described by him in 1914. The tumour was lobulated, and each lobule was covered by exuberant chorionic epithelium, while the tissue between the vessels was myxomatous; the entire tumour therefore was composed of purely chorionic tissue. A distinct kink in one vessel leading to the tumour suggested some obstruction in the circulation as a causal factor.

Treatment of Urinary Incontinence in Parous Women.

Professor B. P. WATSON read a paper on incontinence of urine in parous women and its operative treatment. Incontinence of urine, he observed, was often associated with cystocele, but frequently occurred without it. It was observed in parous women, and the cause was a sagging downwards of the neck of the bladder from behind the posterior aspect of the pubis rather than weakness of the sphincter itself; it was produced by overstretching of the pubo-vesical layer of the pelvic fascia by the foetal head during labour. It might be prevented by a timely episiotomy. The operation he described was similar to that employed by Eden and Lockyer for the radical cure of cystocele, except that the first stitch was placed well out and close to the posterior aspect of the pubis. The fascia was thus brought together over the neck of the bladder; catgut was the suture used. The results showed that out of 48 cases 28 were cured, 16 were improved, and 4 were no better. The paper was discussed by Professor DONALD, Mr. BECKWITH WHITEHOUSE, Professor BLAIR BELL, Dr. EDEN, Dr. HAIG FERGUSON, Dr. FITZGIBBON, Professor LOWRY, and Dr. HERBERT SPENCER. Considerable difference of opinion was expressed as to the nature of the bands seen on the deep surfaces of the lateral flaps. Professor BLAIR BELL maintained that they were not fascial, but composed of involuntary muscle, similar to that found in the utero-sacral ligaments. They should undergo involution after labour, and if they failed to do so incontinence was produced. Dr. FITZGIBBON said that in the cases in which operation failed cystoscopic examination revealed a spot of inflammation at the neck of the bladder. Professor HERBERT SPENCER used silk sutures, and maintained that all cases could be cured by proper operative measures. All the speakers, however, were agreed regarding the preventive value of episiotomy.

Contraction Ring Dystocia.

Dr. FITZGIBBON read notes on three cases of contraction ring dystocia. The patients had had 4, 11, and 3 children, and in each the labour was unduly prolonged, in one case for over two days. In one case pituitrin was given, and this probably accentuated the condition, although it did not cause it. In each case the foetus presented by the head, which was free above the brim in two cases and in the third reached the outlet. In one case, although forceps could be applied they could not be placed sufficiently satisfactorily to justify delivery of the head from above the brim, and version was decided on. In the other cases delivery was effected by forceps. In the case delivered by version it seemed at first impossible to pass the hand above the contracted portion of the uterus so as to reach the foetal limbs. In one of the cases delivered with forceps the head was brought over the perineum and in the other down to the perineum with ease, but advance then ceased. The ring in each case was closely applied to the foetal neck while the cervix was widely open and hanging loosely round the head. The ring resisted dilatation for some time in each case but then began to relax, and once this started the relaxation proceeded rapidly and delivery was easily effected—in the case of version and in one of the forceps cases—of living infants. The other case was moderately hydrocephalic. The treatment was practically the same in each case and consisted in the application of a steady dilating force upon the contracted ring, in one case by the passage of a hand between the ring and the foetal body and in the others by bringing the foetal shoulders down against the ring by traction on the foetal head. The ring remained unaltered for six or seven or ten minutes and then relaxed. The condition was closely allied to that found in imprisoned placenta, and the behaviour of the uterus what was to be expected in the case of a muscular organ.

The paper was discussed by Drs. LOCHRANE and SHANNON, Dr. HERBERT SPENCER, Mr. WHITEHOUSE, and Professor LOWRY. Dr. Shannon said that with deep anaesthesia and forceps the child often came away, but not always. In such cases craniotomy followed by version was the best treatment. Dr. Spencer advised cleidotomy followed by the application of a weight. Mr. Whitehouse thought that cleidotomy and version would be difficult to carry out, and did not see how craniotomy could be of benefit. Professor Lowry advised the administration of morphine and chloroform, and that no attempt to deliver should be made for half an hour; premature interference merely stimulated an already irritable uterus.

Professor R. J. JOHNSTONE (Belfast) demonstrated by means of blackboard sketches some uses of the continuous catgut suture in gynaecology.

Short Papers and Demonstrations.

Developmental Intersexuality.—Dr. F. A. E. CREW (Animal Breeding Research Department, University of Edinburgh), in a paper on this subject, said that abnormality of the reproductive system, in which the external genitalia are of an imperfect female pattern and the internal genitalia consist of paired maldescended testes and a double set of structures (male and female) comprising the accessory sexual apparatus, was common among mammals and was usually referred to as tubular partial hermaphroditism. It was suggested that this

condition was the result of retardation in the exhibition of the sex hormone in a male. Normally in a male the sex hormone encouraged the fuller development of the Wolffian ducts, inhibited that of the Müllerian ducts, and guided the growth of the urogenital sinus and genital tubercle into scrotum and penis while controlling the parallel development of the testes and the gubernacular apparatus. In the absence of the directing control of the male sex hormone the Wolffian and Müllerian ducts pursued an equal and parallel development, and the urogenital sinus and genital tubercle continued their undifferentiated growth. Later these structures lost their embryonic plasticity, so that, when the sex hormone was elaborated, they were no longer capable of being affected. What was affected were the secondary sexual characters and the sexual behaviour, so that at the time of sexual maturity the individual had to be regarded as a male.

Dr. HERBERT SPENCER showed a specimen of congenital deformity of the posterior lip of the cervix in a virgin aged 52. The lip was elongated and hypertrophied, so that from base to tip it measured 2½ inches in length, forming a reddish lobulated tumour which filled the vagina and bulged the intact hymen. There was hypertrophy of the supravaginal cervix. Microscopically the tumour consisted of fibrous and muscular tissue covered with stratified epithelium and containing glands lined by a single layer of columnar epithelium. Dr. Herbert Spencer also demonstrated Dr. Butterfield's photo-micrographic attachment to an ordinary camera for taking photographs of microscopic slides without the use of a microscope. Magnification could be obtained up to 35 diameters.

Dr. HAIG FERGUSON showed: (1) A uterus fifteen days after Caesarean section from an eclamptic patient who had died from cerebral haemorrhage. The scar was invisible to naked-eye and even to microscopic examination. (2) An adenomyoma of the posterior vaginal wall simulating epithelioma. (3) Large subperitoneal fibroid with severe intraperitoneal haemorrhage from a ruptured vein on the surface. (4) Adenocarcinoma of the cervix in a nullipara. (5) Utero-vesical fistula plugged by the cervix; a vesico-vaginal fistula had formed during delivery of her sixth child, and after several unsuccessful attempts to close the opening a surgeon plugged up the opening with the uterus. The patient menstruated through the bladder, and by careful hygiene, washing out the bladder twice daily, etc., she had comfort for two years. Calculous deposits then began to form inside the bladder, on the lips of the cervix, and on clots of menstrual blood. These had to be removed every six months. The calculi set up bladder ulceration which resulted in the formation of several small vesico- and urethro-vaginal fistulae. The patient died nine years after operation of an ascending infection of the kidneys and Fallopian tubes.

A lively interchange of views on the best suture material for use in cases of vesico-vaginal fistulae took place between the Chairman and Professor Blair Bell; the former declared that if silver wire sutures were used every case could be cured; the latter that the use of silver wire was a retrograde step and that only catgut was justifiable. He did not claim to cure every case, however, as Dr. Herbert Spencer said could be done if silver wire were used. The silver wire sutures were removed afterwards.

Professor B. P. WATSON showed a uterus with a perfectly healed scar after Caesarean section. The patient had had Caesarean section performed in the South of England three years ago. Convalescence had been febrile, and, fearing the condition of the scar, Professor Watson decided to do a second Caesarean operation, although there was no pelvic contraction; the uterus was removed, leaving the ovaries. The scar had healed perfectly, and no trace of it could be found even microscopically. He had made inquiries regarding the suture material used, and found it had been interrupted catgut inserted through the entire depth of the wound except the mucosa. The wound had then been covered by a Lembert suture. It did not therefore hold that a febrile convalescence was necessarily followed by a weak scar, or that the dictum "Once a Caesarean, always a Caesarean," was always true. Professor Watson then demonstrated Cullen's sign of ruptured ectopic pregnancy in an old scar after an operation for appendicitis. The general opinion of the members was that the sign was of little or no value, the umbilical pigmentation being rarely present, and probably a mere coincidence when it was.

Mr. BECKWITH WHITEHOUSE showed a specimen of cervical fibroid with a vein opening into the cervical canal; severe haemorrhage and collapse had occurred after a fit of coughing; myomectomy, followed by hysterectomy, was successfully performed.

Dr. C. D. LOCHRANE described a case of endometrial adenoma of the abdominal wall following ventro-suspension three years before. The tumour lay in the right rectus sheath, was more than half the bulk of the corpus uteri, and on section was found to contain a large number of small cystic spaces containing dark fluid blood, lined by columnar or flattened epithelium and surrounded by a stroma-like mantle. The tumour became enlarged and tender during each menstrual period. The body of the uterus was found connected with the site of operation scar by a peritoneal band one and a half inches long. The right ovary was adherent and contained several haemorrhagic cysts. Dr. Lochrane believed that the tumour had arisen from an implantation of endometrial tissue, carried by the catgut sutures passed between the uterus and abdominal wall at the first operation.

Dr. R. W. JOHNSTONE read notes of a case of endometrioma of the posterior vaginal wall associated with "chocolate cysts" of the ovary. The chief symptoms had been intramenstrual dysmenorrhoea, dyspareunia, and sterility. Several speakers objected to the term "endometrioma" as unnecessary. "Adenomyoma" was sufficient. Mr. WHITEHOUSE related a case exactly similar to that described as "endometrioma" in an appendix scar in a male. Professor BLAIR BELL, however, maintained that the term "endometrioma" expressed the function of the small glands which rest in an endometrial stroma and also menstruate; an adenomyoma did not menstruate, and endometriomata were never found before puberty.

Dr. JAMES YOUNG showed lantern slides of an early ovum calculated to be about fourteen or fifteen days old. The blastocyst showed no projection of mesoderm into the trophoblast, and the trophoblast, unlike the Teacher-Bryce ovum, consisted almost entirely of cells of the Langhans type.

Dr. F. J. BROWNE (Edinburgh) read a short paper on some problems of latent syphilis, and also demonstrated a specimen of congenital absence of the left half of the diaphragm in a foetus.

This concluded the proceedings, and the members were afterwards entertained to tea in the reception room of the Royal College of Surgeons.

Reviews.

THE MECHANICS OF THE DIGESTIVE TRACT.

IT might be said that the plausibility of a hypothesis varies inversely with the number of suppositions on which it is founded. The fewer the assumptions required to support it, the more likely is it to be correct. The aim of all biologists is to make use of as few hypothetical factors as possible in working out a reasoned explanation of observed facts. History shows frequently how the earlier hypotheses regarding any phenomenon tend to be complicated and involved, and how gradually, as more and more comes to be known of that phenomenon, one by one the unnecessary assumptions are pruned away, till ultimately the whole series of facts is found to be capable of explanation on the basis of one general fundamental law. Simplification is the essence of wisdom. The truth of these remarks is well exemplified in a book by Dr. ALVAREZ, entitled *The Mechanics of the Digestive Tract*,[1] in which he has collected and summarized the numerous contributions he has made during the past few years to the physiological journals. Instead of being content with the vague general concepts of vagotonia and sympatheticotonia, instead of invoking the autonomic nervous system as the primary cause of intestinal movements, he has studied the reactions of the actual muscle itself, and has found in it certain properties which are sufficient to explain a large number of phenomena hitherto generally supposed to be dependent on the action of extraneous and more complicated factors.

Evidence is first brought to show that the circular muscle of the intestine is able to contract—and to contract rhythmically—after being deprived of all nerves. The stimulus giving origin to the beat is in the muscle itself. Dr. Alvarez tells us, moreover, that strips of muscle removed from different portions of the small gut show variations in rhythm. For

[1] *The Mechanics of the Digestive Tract.* By Walter C. Alvarez, M.D., George Williams Hooper Foundation for Medical Research, University of California. New York: Paul B. Hoeber. 1922. (Demy 8vo. pp. xii + 191; 22 figures. 3.50 dols.)

instance, the duodenal muscle contracts twenty times a minute, that at the lower end of the ileum only ten times a minute. The ratio of rhythmic contraction in the small intestine varies inversely as the distance from the pylorus. A definite gradation in rhythm is seen on passing down from the upper to the lower parts of the gut. But there are other gradients noticeable besides the rhythmic gradient. On comparing the duodenal muscle with the muscle of the lower ileum Dr. Alvarez has found that the latent period in the former is shorter, that its tone is greater, that its tendency to beat when removed from the body and placed in warm oxygenated Locke's solution is greater, and that its irritability to distension by gases also is greater than in the case of the latter. Further examination shows that the output of carbon dioxide is higher in the duodenum than in the ileum, and that the catalase content of the muscle is likewise greater. There is, in fact, a distinct parallelism between the gradients of rhythmic contraction, production of carbon dioxide, and catalase content. In other words, the metabolism of the upper part of the bowel is more rapid than that of the lower, and there is a graded difference between the two. Stimulate the small gut at any one point, and a wave of contraction spreads out in both directions, but because of the higher resistance of the cephalic segment and the lower resistance of the caudal segment the wave is more marked and travels farther in the downward direction.

All this is physiological. Under diseased conditions alterations in the various gradients arise leading to reversed peristalsis and other disturbances of contraction. It is these—a description of which unfortunately would take too long to give here—which are so interesting from a clinical point of view. Reasoning from ascertained fact the author uses his gradient theory to shed light on the most diverse conditions, such as indigestion, constipation, intestinal obstruction, vomiting of pregnancy, dietetics, the action of drugs, and other subjects which should claim the attention alike of the physician, the surgeon, and the gynaecologist. It is a wide, comprehensive, and illuminating theory. It is advanced in no spirit of dogmatism but with the caution of an experienced scientific worker; and no claim is made as to its finality.

The book will be widely read and widely appreciated. It is both helpful and stimulating. It is provided with an excellent bibliography, containing 456 references to original papers—altogether invaluable to those engaged in research. We will not add more to the list of reasons why it should be read. We recommend it unhesitatingly to all interested in the physiology and pathology of the animal body.

DISEASES OF CHILDREN.

DR. J. H. HESS'S *Principles and Practice of Infant Feeding*, first published in 1918, has now reached its third edition.[2] It is smaller than many books devoted to this difficult subject, and on that account is somewhat easier to read, though perhaps not less difficult to understand. Dr. Hess is of the Czerny-Finkelstein school; but while still following that teaching and classification, he has in the present edition adopted some new names. He now divides the nutritional disturbances of infants into those unassociated with diarrhoea, those characterized by diarrhoea, athrepsia, and anhydraemia. But these new words are only other forms of Finkelstein's terms, disturbance of balance, dyspepsia, decomposition, and intoxication; and they only add to the artificial complications of the subject. Our real knowledge of dyspeptic infants is at present hidden under a mountain of prodigiously long names, which are worthy of the ingenuity of mediaeval theologians. These names do not accurately describe clinical phenomena, nor do they succeed in grouping them into a satisfactory pathology. As for therapeutics, though the ingenious but hypothetical pathological conceptions introduced by the German schools of Czerny-Finkelstein have strongly influenced treatment, yet it should be recognized that the method is empirical; not the wise and safe empiricism founded on experience and clinical observation, but that which rests on pretty but unsubstantial pathological theories. Dr. Hess gives most careful and detailed accounts of treatment, but does not record a single case illustrating its results; he, indeed, shows two charts, one labelled decomposition, the other lobar pneumonia complicated by enteritis; but without more clinical details they are of little value. Some chapters are also devoted to rickets, spasmophilia, scurvy, acidosis, and the anaemias of infancy. The author deals at length with the various theories of origin of rickets, with recent experimental work, with morbid anatomy and chemistry, but very summarily with the clinical features. Fig. 15 is a photograph of "a colored infant" showing marked rickets; Fig. 17 is given as a radiograph of the wrist of the same infant, but the ossification of the carpal bones is of a stage much later than infancy and would indicate an age of at least 5 years. The book concludes with an appendix of formulae and other miscellaneous information.

The book on diseases of children by Professor E. FEER of Zürich was first published in 1911; it has now reached its seventh edition. The author obtained the co-operation of a number of Austrian and German authorities, including von Pirquet, Pfaundler, Finkelstein, Moro, and Meyer. A book entitled a *Textbook of Pediatrics*,[3] founded upon Feer's volume, which was written in German, has now been produced in English by Drs. SEDGWICK and SCHERER. To it there are nine German contributors and fifteen American, and it is not quite clear how far the work of the latter is faithful translation and how much is revision and alteration. The general plan and main divisions remain as in the German book, and as it includes within its nine hundred odd pages a long section on infectious diseases and another on diseases of the skin the book cannot be described as too big for its scope. The number of illustrations is large (262), and some of those in the section of skin diseases are particularly clear and good; on the whole, however, the quality of the photographs is disappointing. There is also a tendency to a too literal translation, resulting in a clumsy form of German-English: for example, "the tendency is *familiar*" (p. 214); "a form of rheumatic disease *coordinal* with the joint inflammations" (p. 551); "rheumatism nodosum" (p. 709); "*grippal* diseases" (p. 699); "a *ptotic* liver" (p. 323). Actual mistakes are also too numerous: on page 505, atheosis should be athetosis; and in the account of rickets there is a reference to *Findlery's* observations (Findlay). Throughout the book there is very little said about the teaching and contributions of the British schools of medicine, and the book must be regarded as presenting a German view of the subject. For example, in reference to the vitamin theory of rickets, the following sentence occurs: "While the theories about this factor have formerly been rather vague, American observers in animal experiments, and pediatricians in the central empires, during the food shortage caused by the blockade have added considerable research to this view."

Feeding, Diet, and the General Care of Children,[4] by Dr. A. J. BELL, is a book whose title reveals its general character. It is written for mothers and trained nurses, and describes in simple language the rules of infant feeding, the preparation of bottles, the hygiene of the nursery, and so forth. It discusses also the diet of older children, supplying diet lists up to twelve years of age. Other chapters are devoted to very short accounts of the symptoms and nature of the commoner diseases of infancy and childhood. Such a book is apt to recall the old saying that "a little knowledge is a dangerous thing"; and while it could do no harm in the hands of a trained nurse it might not be harmless in those of the average mother. The aim of the book is praiseworthy, and the simple, clear style is well adapted to achieve it.

Dr. WALTER BIRK'S book on diseases of infants is a companion volume to that on diseases of children, already noticed. The present volume is the fifth-sixth edition,[5] the first having appeared early in 1914. The book seems popular in Germany and translations have been published in American, French, and Italian. In trying to explain this success, one is struck by the small size of the book; the physiology and feeding and diseases of infants are dealt with in 275 pages. As it is written expressly for students and practitioners, this brevity gives it an advantage. There are four sections, dealing with the dietetics of infancy, the diseases of the newborn, the

[2] *Principles and Practice of Infant Feeding.* By Julius H. Hess, M.D. Third revised and enlarged edition. Philadelphia: F. A. Davis Company. 1922. (Demy 8vo, pp. xvi+496; 34 figures. 4 dols. net.)

[3] *Textbook of Pediatrics.* Edited by Professor E. Feer, Zürich. Translated and edited by J. P. Sedgwick, B.S., M.D., and C. A. Scherer, M.D., F.A.C.P. First edition in English. Philadelphia and London: J. B. Lippincott Company. 1923. (Med. 8vo, pp. xviii + 917; 262 figures. 42s. net.)

[4] *Feeding, Diet, and the General Care of Children. A Book for Mothers and Trained Nurses.* By Albert J. Bell, A.B., M.D. Philadelphia: F. A. Davis Company. 1923. (Post 8vo, pp. xiii+276; 11 illustrations. 2 dols. net.)

[5] *Säuglingskrankheiten.* By Professor Dr. Walter Birk. Fifth and sixth edition. Bonn: A. Marcus and E. Weber. 1922. (Demy 8vo, pp. xii + 282; 26 figures.)

nutritional disorders of infants, and the diseases of infants. Following the classification of Czerny and Keller, the author divides nutritional disorders into food injuries, infections, constitutional disorders, and congenital defects. As is common in German textbooks, he gives a full description of the exudative diatheses of Czerny. This section is well done, and the principles of treatment are fully explained without excessive detail. The section dealing with diseases of infants is perhaps abbreviated to a dangerous point; but there is an adequate account of congenital syphilis, and also of the common respiratory disorders of infants. The description of nervous diseases is pressed into six pages, and is quite inadequate.

TREATMENT OF FRACTURES.

THE ninth edition of *The Treatment of Fractures*,[6] by C. L. SCUDDER, has recently been published. The book is now so well known that it is no exaggeration to say that it is the standard American work on the subject. Since the appearance of the eighth edition in 1915 an enormous number of cases of fracture have been under treatment as the result of the war. Experience gained from these cases has to a certain extent modified surgical procedure, for the principles of treatment are the same in civil as in military surgery. It has come to be generally recognized that a fracture is not only a lesion of bone, but may also be associated with injury to the skin, muscles, blood vessels, nerves, and to joints in the neighbourhood of the fracture, as well as to the several viscera protected by bony structures. Treatment to be efficient must be directed not only to procuring accurate union of fragments, but to the restoration of the surrounding soft parts. Perhaps some of the outstanding advances in the treatment of fractures may be summed up as follows: The need for immediate operative treatment on all cases of compound fracture, with removal of damaged tissues and efficient fixation. The proper treatment of shock. The acknowledgement that the indirect and direct traction principle is capable of correcting shortening in fractures of long bones, and that the cases in which direct fixation by the use of metallic sutures and plates is indicated are relatively few. The necessity for the early active movements of joints contiguous to the fracture. The value of active as distinguished from passive movements of joints. And lastly, the absolute necessity for *x*-ray examination of fractures both before and during treatment.

Throughout his work Dr. Scudder pays attention to the prognosis in the various forms of fracture, and a clear guide is given as to the probable period of disability. The book is most admirably printed and fully illustrated, with *x* rays, diagrams, and photographs which greatly add to its value.

Cases of so-called simple fracture are often dreaded by the general practitioner and surgeon alike, and the result is frequently highly unsatisfactory from the patient's point of view. The book under review should prove of real help in the treatment of these difficult problems, and can be strongly recommended.

ST. MARY'S HOSPITALS, MANCHESTER.

THE *History of the St. Mary's Hospitals, Manchester*,[7] prepared by Dr. J. W. BRIDE, is based on an analysis of the early registers showing the obstetric work of the hospitals. In the course of that undertaking he learned much of interest concerning the early history of the institution, and decided to make it accessible to others. The result is a concise, clearly expressed account of the hospital since its foundation. It contains chapters on the administration and management of the institution and its gradual development, with a series of short biographies of twenty-one former honorary physicians and surgeons. A list of all the honorary members of the staff who have been connected with the hospital since it was first established is given in an appendix. Within the limits to which he has confined himself Dr. Bride has done the work well and, as far as we can judge, accurately. The present charity, known as the "St. Mary's Hospitals," consists of a handsome modern building with 121 beds adjoining the Royal Infirmary, devoted exclusively to gynaecology and diseases of children, and another equally modern building of 58 beds with 50 babies' cots for the reception of maternity cases, situated more in the centre of the town. It was formed in 1904 by the amalgamation of the old St. Mary's Hospital for women and children with the more recently established Southern Hospital, also for women and children.

The older institution, known since 1854 as St. Mary's Hospital but originally designated "the Manchester Lying-in Hospital," was founded by Mr. Charles White, F.R.S., in conjunction with his son Thomas and his friends Drs. Edward and Richard Hall in the last decade of the eighteenth century, a century prolific in the establishment of medical charities, which have survived to the present day. It is interesting to note that with the exception of St. Bartholomew's at Rochester, dating from 1078 A.D., and the Bath Mineral Water Hospital, from 1610 A.D., the eighteenth century opened apparently without any provincial hospitals. Addenbrooke's Hospital, Cambridge, was founded in 1719; between 1735 and 1750 six more came into being, and by the end of the century the number had been increased by thirty-one more, of which ten were established in the last decade. St. Mary's Hospital, opened in May, 1790, was in point of age the second lying-in charity in the provinces; the Newcastle-on-Tyne Maternity Hospital was established in 1760 and the Liverpool Maternity Hospital in 1796. Its first habitation was a small house, from whence it was transferred to more commodious premises, and in 1855 to a building especially erected for the purpose in Quay Street. Finally, the present building in Whitworth Street, now used for maternity cases only, was opened in 1903. The development of the hospital presents some points of interest. It was originally designed for lying-in patients only; a considerable number were admitted for their confinements, but most were attended at their own homes. The scope of its work was gradually altered; fewer and fewer cases were admitted as in-patients, until in 1816, partly from inadequacy of funds and other reasons, all patients were attended at their own homes. Coincident with this diminution in the maternity in-patients there was developed an out-patient department for "all diseases peculiarly incident to women, and to children under two years." Some years later in-patient accommodation was provided for difficult maternity cases and also, with the advance of gynaecology, provision for diseases of women in general. Amongst the twenty-one short biographies of former members of the staff the first place is naturally given to Charles White, the founder of the hospital, a remarkable man and a picturesque figure; lack of space, and no doubt the fact that his career has been amply treated of elsewhere, have prevented Dr. Bride from doing full justice to him. He was 62 years of age when he founded the hospital; he had long been distinguished as a general surgeon, and, as an obstetrician, had revolutionized the management of lying-in women. Without a knowledge of the conditions of life at that period, it is difficult to appreciate the originality to conceive, and the energy and force of character required to enforce, the line of treatment he introduced.

In this connexion it may help a little to remember that White must have worked under conditions and in surroundings similar to those depicted by Hogarth, for they were contemporaries, though Hogarth died in 1764, when White was 36. In 1752 White had been instrumental in founding the Manchester Royal Infirmary and was an active member of the staff for thirty-eight years, when, owing to a dispute with the board of management, he resigned and took part in the founding of the maternity hospital.

Dr. Bride does not make any adequate reference to the Southern Hospital, which was an integral part of the present St. Mary's Hospitals. It was established about 1866, through the exertions of Dr. John Thorburn, a man of great public spirit and high repute, who was Professor of Obstetrics and Gynaecology at the Owens College, which became later the Victoria University of Manchester. It was founded as a hospital for diseases of women, including maternity cases, and children. On the death of Professor Thorburn, Dr. W. J. Sinclair became the leading surgeon there, and when he succeeded to the professorship of obstetrics and gynaecology the hospital became closely identified with the university. In 1893 the David Lewis Trustees offered £70,000 to build a new joint teaching hospital on a site near the university, on the condition that the two institutions were amalgamated and that the university participated in the control of the new hospital. The scheme fell through, owing to the inability of those concerned to come to a satisfactory agreement, and the money was used to found the David Lewis Epileptic Colony at Sandlebridge, Cheshire. Ten years later, conditions having

[6] *The Treatment of Fractures, with Notes upon a few Common Dislocations.* By C. L. Scudder, M.D. Ninth edition, revised. Philadelphia and London: W. B. Saunders Company. 1923. (Roy. 8vo, pp. 749; 1,252 figures. 42s. net.)

[7] *A Short History of the St. Mary's Hospitals, Manchester, and the Honorary Medical Staff, from the Foundation in 1790 to 1922.* By J. W. Bride, M.D. Manchester: Sherratt and Hughes. 1922. (Cr. 8vo, pp. 132; 10 plates. 6s.)

altered, the amalgamation was successfully carried out with other funds. All these matters are briefly noted in the book in a manner that excites interest and makes the reader wish that the author had been a little less concise. We would especially have liked to know more about Dr. Clay, the Father of Ovariotomy in this country.

ABDOMINAL PAIN.

DRS. WILLIAM BRAMS and ALFRED LUGER, who have translated Professor NORBERT ORTNER'S book on *Abdominal Pain*,[8] state that the teachings of Bamberger, Neusser, and Ortner are presented in it. We regret that they are not expressed more clearly, though we suspect that the translators are in some measure to blame. The headings of the chapters are well chosen—diffuse abdominal pain, localized abdominal pain, epigastralgia, pain in the right hypochondrium, and so forth—but the promise of orderly information held forth is not fulfilled in fact; there is too much repetition and too much confusion. There are a few good points—such, for instance, as the fact that in intestinal colic pain is of a wave-like character, rising to a maximum and then subsiding with more or less complete relief until the next wave comes. In biliary and urinary colic, on the other hand, the pain is continuous, perhaps for hours, with only slight variations in intensity. On the whole only a skilled clinician will gain anything from the book, as only such a one will know how to separate the plums from the vast amount of pudding in which they are embedded. An extract from page 51 will give an idea of the author's catalogue-like method. He is speaking of the abdominal crises of tabes, and goes on to say "such crises may be due to causes other than tabes—as, for instance, spinal lues, syringomyelia, multiple sclerosis, myelitis, diabetes, Basedow's disease, tuberculosis, syphilis, neoplasms, actinomycosis of the intraspinal roots, chronic morphinism, disease of the coeliac plexus, pancreatitis, lesions of the lesser curvature of the stomach or of the cardia, retroperitoneal glands, and aneurysm of the abdominal aorta."

SURGERY.

THE appearance of the fourth fascicule of *La Pratique Chirurgicale Illustrée*,[9] by VICTOR PAUCHET, brings out in many ways the contrast between English and French methods. The volume is well got up and there are numerous illustrations depicting the minutiae of each step in the operations. It deals with a variety of subjects. For example, M. Pauchet tells us that he treats recurring dislocation of the shoulder-joint by excision of a portion of the lax posterior part of the capsule. The arm is abducted to a right angle and the skin incision is made in the axilla along the line of the neuro-vascular bundle, which is retracted forwards. For a surgeon possessing the necessary anatomical knowledge the operation is said to be simple. The author accepts the view that adenomata of the breast and chronic mastitis are due to chronic intestinal stasis. In all doubtful cases of malignancy he strongly advises local excision followed by microscopical examination; the radical operation, should it then be found necessary, being deferred until a later date. He considers this step essential, not only for establishing the diagnosis, but also the prognosis. What happens to the lymphatic spread following this intervention, should the tumour be malignant, is not discussed, and the method can be hardly said to be an advance on that of rapidly cutting a section by means of the freezing microtome and examining it at the time of the operation. The radical operation recommended follows the usual lines, except that the incision does not go so low; mention is not made of the lymphatic spread along the rectus sheath. He considers two applications of radiotherapy before operation useful. Of cases of duodenal ulcer treated by gastro-enterostomy he says that 70 per cent. are completely cured, and that 30 per cent. suffer from after-trouble, including haemorrhage, perforation, and jejunal ulcers (5 per cent.). Catgut is used throughout in the form of three rows of sutures. A transverse incision is advocated as giving good approach and a means of exploring the gall bladder, appendix, and looking for signs of stasis. In an article on the biliary tract its physiology and its relations to the pancreas, as well as the formation of gall stones, are discussed; the gastric content was found to be normal in the majority of cases of gall stones. For carcinoma of the caecum right hemicolectomy with end-to-end anastomosis is performed. For carcinoma of the rectum he advocates permanent colostomy followed in fifteen days by the application of radium and in six weeks by excision of the lower bowel by the abdomino-perineal route. For fibrous contraction of the rectum temporary colostomy is performed followed by perineal excision and reconstitution of the bowel. This is no doubt the ideal method, but the author does not say in what percentage of cases it is possible.

[8] *Abdominal Pain.* By Professor Norbert Ortner of Vienna. Authorized translation by William Brams, M.D., and Dr. Alfred P. Luger. New York: Rebman and Co. 1922. (Post 8vo, pp. 362. 5 dols.)

[9] *La Pratique Chirurgicale Illustrée.* By V. Pauchet. Fascicule IV. Paris: O. Doin. 1923. (Imp. 8vo, pp. 247; 307 figures. Fr. 25.)

NOTES ON BOOKS.

UNDER the title of *Puerperal Sepsis and its Prophylaxis*[10] Dr. THORP, the Assistant Medical Officer of Health for Sunderland, and Borough Medical Officer for Maternal and Child Welfare, has summarized a good deal of clinical knowledge of the condition named, and indicated the treatment he has found useful in his official practice. The most valuable part of his short book is the section on prophylaxis, especially as bearing upon the management of maternity homes. His recommendations include the daily inspection of the fingers of the midwives and pupils by the matron, and he emphasizes the doctrine that the value of soap and water is much greater than that of antiseptics for the hands. "Too much reliance is placed upon the perfunctory use of antiseptics by pupils and midwives, sufficient time for action of these being rarely given." He might have added also that the strength which most skins can tolerate is quite inadequate for the purpose of the destruction of organisms. It is high time that this fetish of a bowl of 1 per cent. lysol or other similar solution should be abolished. The author says:

> Surgical obstetrics should never be carried out without an anaesthetist. It is impossible to administer chloroform and apply forceps and remain sterile.
>
> There is room for more specialists in midwifery in great industrial areas. Too often surgical procedures of grave import have to be undertaken by practitioners with little experience and with less liking for the work and with totally inadequate help.
>
> A very much improved training of midwives is required, with particular supervision of the training afforded in small maternity homes.

The above quotations may suffice to indicate the lines upon which Dr. Thorp deals with this question of prophylaxis; their value, and indeed the value of the whole pamphlet, is enhanced by its being written by one who is not himself an obstetric specialist. We trust it will have a wide circulation, as a perusal of it cannot fail to be helpful and instructive alike to medical practitioners, public health officials, and nurses.

The fourth quarterly volume of *International Clinics*,[11] edited by Dr. HENRY CATTELL of Philadelphia, in collaboration with several distinguished members of the profession in America, the British Isles, and Canada, contains a number of illustrated clinical lectures and original articles dealing with medical welfare work, nutritional problems, clinical medicine, surgery, and pediatrics. In an article on diphtheria Dr. Parker Hitchens of Washington attempts an estimate of the value of the Schick test; he found that the percentage susceptibility to infection between the ages of 1 and 2 years was 70, and that there was a gradual decline to 15 per cent. over the age of 20 years. In cases where the test is positive and there is a history of definite exposure, an immediate injection of antitoxin should be given. In other circumstances the injection of toxin-antitoxin mixture as a prophylactic measure has been of the greatest value in raising immunity. He states that the annual number of deaths from diphtheria in America was formerly 80,000. Since the use of antitoxin the number has fallen to 20,000, and by the routine application of the Schick test the number should, he thinks, be further reduced. The method should, he thinks, be more widely used for dealing with carriers in schools and children's hospitals.

A German version, apparently much shortened (but it has no table of contents, no index, and no list of illustrations), of Dr. PARKES WEBER'S book, *Aspects of Death*, has been prepared by EUGEN HOLLÄNDER under the title *Des Todes Bild*.[12] The illustrations selected for reproduction are well printed and the book in its German form makes a very agreeable appearance. The full English edition was reviewed in our columns of July 1st, 1922 (p. 16).

[10] *Puerperal Sepsis and its Prophylaxis.* By Eustace Thorp, O.B.E., L.R.C.S., L.R.C.P. and L.F.P.S.G., D.P.H. Bristol: John Wright and Sons, Ltd.; London: Simpkin, Marshall, Hamilton, Kent, and Co., Ltd. 1922. (Cr. 8vo, pp. 48; 6 charts. 2s. 6d. net.)

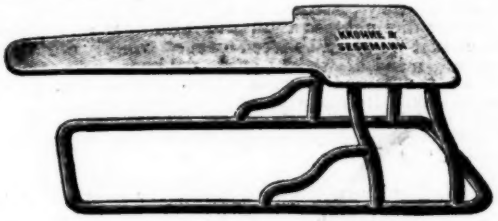
[11] *International Clinics.* Edited by H. W. Cattell, A.M., M.D., Phil.U.S.A. Vol. iv. Thirty-second Series, 1922. Philadelphia and London: J. B. Lippincott Co. 1922. (Med. 8vo, pp. vi + 312; illustrated. 42s. the set of 4 vols.)

[12] *Des Todes Bild.* Von Frederick Parkes Weber, M.A., M.D., F.R.C.P., F.S.A. Bearbeitet von Eugen Holländer. Berlin: F. Fontane and Co. 1923. (Demy 8vo, pp. 247; illustrated.)

MEDICAL AND SURGICAL APPLIANCES.

A Pelvic Support for Plaster Bandaging.

MR. E. MUIRHEAD LITTLE, F.R.C.S. (London), writes: In the applications of plaster-of-Paris to the pelvic region and upper parts of the thighs, as in the treatment of congenital dislocation of the hip, or after operations upon the hip-joint and upper end of the femur, a good support is a desideratum. Such a support should interfere as little as possible with the application of bandages; the part included by them should be as small and thin as possible, and it should be easy to remove the support after the application is complete. The appliance shown in the accompanying illustration



represents an attempt to fulfil these conditions. It was made according to my design for use at the Royal National Orthopaedic Hospital some ten years ago, and has been in general use ever since. The one size of support can be used for almost any sized patient, including infants and adults. The smaller the patient the smaller the part of the support included in the plaster. The whole of a small child's trunk can be supported by it, but in the case of an adult sandbags or some other prop under the shoulders are necessary. Having proved the usefulness of the appliance by a long trial I feel justified in recommending it to all surgeons who may have to apply gypsum to the pelvic region. I am indebted to the makers, Messrs. Krohne and Sesemann, for the illustration.

The Disinfection of Water-Closets.

The practice of disinfecting water-closet pans is considered by some persons as entirely unnecessary, for they maintain that if the fittings are properly fixed and the contents of the pan are speedily discharged down the soil pipe with a good flush of water disinfection must be superfluous. On the other hand there are many who will not be satisfied unless a disinfectant in some form accompanies each flush from the cistern. For the use of these an automatic appliance called the Lewbart Disinfector has been devised, which is fixed on the flushing pipe and is so arranged that each time the contents of the cistern are discharged five drops of a concentrated disinfectant are mixed with seven ounces of water from the cistern and pass into the pan and soil pipe after the flushing is completed. The disinfectant container, it is stated, requires refilling about every three months. It is claimed that the apparatus, which costs 35s., can be fixed by an unskilled person. It is obtainable from the Lewbart Manufacturing Company, Ltd., 2 and 3, Norfolk Street, Strand, London, W.C.2.

RECENT ADVANCES IN MEDICAL EDUCATION IN ENGLAND.

SECOND MEMORANDUM BY SIR GEORGE NEWMAN.

[*Second Notice.*]

THE CLINICAL STUDY OF MEDICINE AND SURGERY.

SIR GEORGE NEWMAN begins this section of his Memorandum[1] by affirming that "the purpose of the medical curriculum is the training not of specialists but of general medical practitioners," but complete knowledge of the science and art cannot be attained in five years, and if this be attempted "the curriculum becomes too heavy and the student is overfed for his size." At his school and hospital the student must be taught clinical methods and the clinical habit, including methods of examination, elucidation of subjective symptoms, laboratory tests, case taking, and record keeping. The Medical Council's new scheme is designed to prevent the student from dropping a subject so soon as he has passed in it; the basal subjects will be continued in their application throughout the course. And the student must learn to treat persons as well as diseases: work, sleep, exercise, dietary, recreation, and so forth, have all to be thought of; also public facilities in the way of clinics, dispensaries, hospitals, etc., have to be borne in mind. When he begins practice he is in a new world, with 60 per cent. of the deaths due to half a dozen conditions, and a third of his insurance patients suffering from bronchitis or dyspepsia, another third from minor injuries, lumbago, debility or anaemia, local sepsis, or the like; there are also defects of the organs of special sense, and notifiable diseases.

A discussion of a minimum standard of competency is illustrated by references to surgery summarized under eleven headings, too long to set out here. The British course of clinical study is set forth by quoting the new regulations of the General Medical Council as officially summarized; the "British method" is described as consisting of (*a*) clerks and dressers, (*b*) bedside teaching, (*c*) clinical lecture demonstrations, (*d*) clinical teaching in the out-patient department, (*e*) clinical work in various special hospitals, and (*f*) junior house appointments. Sir George Newman holds that "it is the pursuance of this system of clinical study which has made English medical education the most practical in the world," and that the Medical Council's action "cannot fail to fortify it and make it more nearly universal."

The chief needs of clinical study are held to be three: "First, the inspiration of all clinical study by science; secondly, an increasing opportunity for the student before qualification to undertake responsible practice under supervision; and thirdly, the permeation of clinical work with a preventive spirit." The author considers that the introduction of the student to the bedside, either under the old apprenticeship system or in the medical school, notwithstanding its common sense, "has brought with it a certain measure of routine and habit which has led to some failure to establish his practice (which has been static) upon his science (which has been progressive)," with the result that "a false antithesis has become current between the scientific man and the practical man." Clinical teaching, it is said, may be so didactic and matter of fact as to fail to awaken mental endeavour, and may be "standardized to the lowest mentality of the student group rather than to the highest." But the teacher should also be leader, "and the students must bestir themselves and *climb up after him.*" Especially in the out-patient department there is risk of "spotting" cases rather than apprehending them. The case, it is insisted, "must be explored by science, system by system, symptom by symptom.' Practitioners "may not, it is true, always be able to practise their profession with this degree of completeness and penetration, but they will by this method of education have learned the scientific approach." This the practitioner may acquire "by observation of signs and symptoms with his own eyes and ears and hands and understanding; then by the uses of instruments of precision: then by directly recording his results; then by experience." The duty of the teacher to train himself in teaching is next insisted on, and it is asked, "How many medical professors have given serious study to the science and method of education?"

In considering clinical experience under supervision it is observed that students have increased more quickly than hospital beds, and that tuberculosis, cancer, and syphilis are often sent to special hospitals, thus restricting the practice in the hospitals of the medical schools. Also more beds are needed now owing to increased study requirements. Towards overcoming these difficulties more use may be made of hospitals hitherto unconnected with schools—ordinary voluntary and Poor Law hospitals; likewise there are the new clinics of local authorities, sanatoriums, dispensaries, infant welfare centres, and venereal disease clinics, school clinics, and so forth. Lastly, as in Ireland, fourth and fifth year students might have three months' stay in hospitals, half the time attached to the medical wards and half to the surgical.

UNIVERSITY CLINICS (CLINICAL UNITS).

Sir George Newman, who attaches much importance to these clinics, gives an interesting historical survey, and enumerates the component parts of a university clinic as follows:

(*a*) An adequate whole-time and part-time staff.
(*b*) The control of wards (50 to 100 beds).
(*c*) A proper and effective out-patient department.
(*d*) Ample laboratory accommodation for investigation.
(*e*) Adequate equipment for effective clinical work and teaching.

He holds that the new recommendations of the General Medical Council express precisely the desired developments, so that "the entering student shall be better furnished for the medical course, and that the contributory sciences shall be integrated." The purpose of the university clinic is teaching and the advancement of learning. The question of whole-time staffing is considered, and various alternatives are discussed, the opinion being reached that in this country the head of the clinic would be permitted to undertake such degree of outside private practice as would not interfere with

[1] *Recent Advances in Medical Education in England.* A Memorandum addressed to the Minister of Health by Sir George Newman, K.C.B., M.D., Hon. D.C.L., F.R.C.P., Chief Medical Officer of the Ministry of Health and of the Board of Education, Crown Nominee to the General Medical Council. London: H.M. Stationery Office, Imperial House, Kingsway, W.C.2. 1923. 1s. 3d. net. (The first notice was published last week at page 723.)

his official duties. As to the rest of the staff the objective would be

not only the "setting apart of one or more whole-time clinicians for educational work, but the best method of creating a team of clinicians who are also laboratory workers, in a unit, under the leadership of a professor who has control of beds, laboratories, and out-patient department, with adequate provision as regards time, equipment, and teaching ability, in order that the clinical education of the student may be directed along lines that will produce the best treatment for patients and the advance of knowledge."

The subject of university clinics is further discussed under the headings of study in the ward, teaching in out-patient department, laboratory work, and auxiliary equipment. Then the present position in this country is considered, and it is said that "the organization is not a new invention, but is the natural development of the English system of clinical teaching," which development may well be allowed to proceed naturally and gradually. Three years of it are held to have shown substantial improvement both in teaching and in treatment of patients; more time and supervision is devoted to students, more work is done by clerks and dressers, and there is less spoon-feeding. The methods and spirit of research are essential in the routine of the university clinic, which is a training school for its staff in the art of teaching. "Lastly," writes Sir George Newman, "the university clinic is integrating medicine," and education is no longer in water-tight compartments. The dangers of an unsuitable director are recognized, but as they receive their appointment from the university that body has its remedy.

OBSTETRICS AND GYNAECOLOGY.

The fact that 60 per cent. of confinements are now attended by midwives increases the proportion of difficult cases left to the medical profession, and at the same time the midwife is bound to call in a doctor to every complicated labour. Yet a committee of the Royal Society of Medicine reported in 1919 that while "the systematic instruction given is, generally speaking, satisfactory, and is in the hands of obstetric physicians," unfortunately "the *practical* instruction leaves very much to be desired, and in some respects merits emphatic condemnation." The main defects were reported as want of beds and of ward teaching, but great improvement had followed the establishment of midwifery wards at certain hospitals, though the teaching was still insufficient. The committee recommended the establishment of obstetric "departments" in some of the larger teaching hospitals with existing maternity wards, and new "centres" in outlying districts of the metropolis, for instruction of medical students apart from pupil midwives, and for ante-natal, natal, and post-natal work. Though additional provision has been made it is still insufficient, and out of over 5,000 beds in the twelve London teaching hospitals there are only about 150 for midwifery and 300 for gynaecology. Poor Law institutions should be used to supplement these, and the claims of the medical student for teaching should come before all others. Sir Francis Champneys reported to the General Medical Council in 1920 that many women trained for the Central Midwives Board examination never practise as midwives, and in about twelve years the cases allotted to such women for training amounted to no fewer than 356,420; at present, indeed, only 22 per cent. of trained midwives actually practise as such. In the provinces increased provision of maternity homes has been made, but most of it is used for pupil midwives. General organization, however, is being improved at many medical schools, and the progress of ante-natal work advocated and illustrated by the late Dr. Ballantyne in Edinburgh has advanced the practice of preventive medicine.

Sir George Newman sketches a scheme of obstetric teaching, and in accord with the General Medical Council advises that each medical school should have available a complete obstetric department, in which senior as well as junior officers should teach, the courses of instruction including obstetrics, diseases of women, and pediatrics, with due integration of the earlier subjects of the medical curriculum with obstetrics. A syllabus of the course is outlined under lectures, demonstrations, clinical teaching, and maternity district work. The clinical teaching should include ante-natal clinic, labour wards, lying-in wards, infant welfare centres, gynaecological wards and operating theatre, out-patient department, and female venereal department. Midwifery should be taught at the bedside just as medicine and surgery are, and records kept of work done. In his report to the General Medical Council, Sir William Smyly, who inspected for the Council the final examinations in these subjects, advised that a clinical examination should be required wherever possible, and the Council has recommended that "in midwifery, where a clinical examination is not held, the duly attested records of the work done by the candidate in clinical midwifery must be presented to the examiners for assessment in the final examination."

PREVENTIVE MEDICINE IN MEDICAL PRACTICE.

Sir William Osler wrote:

"When the thoughtful historian gets far enough away from the nineteenth century to see it as a whole, no feature will stand out with greater distinctness than the fulfilment of the prophecy of Descartes that we could be freed from an infinity of maladies, both of body and mind, if we had sufficient knowledge of their causes and of all the remedies with which Nature has provided us. Sanitation takes its place among the great modern revolutions—political, social, and intellectual. Great Britain deserves the credit of the first practical recognition of the maxim *salus populi suprema lex*."

The foundation knowledge required for preventive medicine is in three departments—the natural history of disease, the cause and circumstances of disease, and the effect of environment. Though in recent times the laboratory has played a great part, it is the general practitioner who laid the foundations—Harvey, Sydenham, Mead, Fothergill, Heberden, Huxham, Baker, Withering, Jenner, Lind, Thackrah, and Taylor of Penrith. In the work of all of them prevention and cure were associated, though engineers, analysts, and administrators are agents in its communal applications; even to-day "much of the actual investigation and differentiation is falling to the medical practitioner."

The application of the scientific method to the control of infections intimately concerns the practitioner, and includes (*a*) study of causes, and early diagnosis; (*b*) prompt application of prophylactic methods, such as serums and vaccines; (*c*) notification; (*d*) isolation and treatment; (*e*) disinfection when necessary; (*f*) detection and control of "contacts" and "carriers"; and (*g*) the adoption of special methods varying in different diseases.

The sphere of preventive medicine extends beyond infectious diseases. There also come within its scope abortion, miscarriage, stillbirths, much infant mortality, children's disorders, such as ophthalmia, rickets, dental decay, and malnutrition, and many diseases of skin, eye, ear, nose, and throat, and among adults much physical impairment due to causes in large measure preventable—rheumatism, dyspepsia, constipation, bronchitis, anaemia, and various others. In surgery, asepsis is a preventive measure, and prevention applies to various conditions both in children and adults, including industrial surgery.

For such reasons the General Medical Council recommends "that throughout the whole period of study the attention of the student should be directed by his teachers to the importance of the preventive aspects of medicine." It is to be a pervading influence. The kind of knowledge needed for the practice of preventive medicine includes personal hygiene of body and mind, a grasp of the etiology of disease, an appreciation of the place and purpose of hygienic environment, and a realization of the effects of social evolution.

"What has been the *medical* effect of industrial revolution or the introduction of steam? of elementary education and religious liberty? of the improvement of roads and transport? of the rise and fall of wages and the cost of living? of the importation of meat and corn? of the growth of the towns?"

Nothing can indicate better than these questions the breadth of outlook of the author of the Memorandum, and the answers he gives to some of them are stimulating. After consideration of ways and means for giving effect to the Medical Council's policy of permeation of the whole curriculum by the principle of prevention, the chapter ends with the following forecast:

"As the National Health Insurance Service becomes stabilized we may anticipate that it will prove an effective instrument in behalf of preventive medicine, for, by its means, the patient is brought early to the doctor, and in due time the doctor will have been trained to cultivate the preventive attitude and method. It is important that the direct instruction of medical students by means of special courses or lectures should not be overdone, nor overweighted with public health."

SPECIAL SUBJECTS ASSOCIATED WITH MEDICINE.

Pediatrics.—The General Medical Council has placed pediatrics foremost among special subjects, and the Memorandum urges that every medical school should have a

department of pediatrics, that a definite period of time —say, three months—following obstetrics should be allocated to child study, and that the subject should be included in the final examination. "Systematic pediatrics (as taught in America) and child welfare (as practised in England) should be associated together, for they are mutually complementary and interdependent."

Psychology and Psycho-pathology.—The requirements of the general practitioner in this branch of knowledge are a clear account of modern psychology, a concept of the unconscious mind, the worth of self-study of normal psychological phenomena, and of deductions from study of abnormal but not insane patients as bearing on therapeutic measures. He must be prepared for emergencies and for diagnosis of the chief forms of mental disease and defect, and for certifying under the several Acts. It is important that mental inefficiency and impairment be prevented, or be detected as early as possible with a view to effective treatment. All this needs training by a course of instruction and clinical work, first in a mental hospital and then in an out-patient clinic. The curriculum, it is suggested by Sir George Newman, should consist of five to ten lectures in normal psychology, preferably in the physiology course; half a dozen explanatory discourses in abnormal psychology, concurrently with clinical work in mental disease; ten or twelve systematic lectures on mental disease, also concurrently with clinical work and demonstrations at a mental hospital; and a series of demonstrations in the out-patient clinic for mental disorders at a general hospital. Medical schools are not yet sufficiently equipped for proper instruction, but advantage should be taken of the special schools for mentally defective children.

Ophthalmology.—Eye affections are so common from birth onwards that this is not properly a special subject. By stages the General Medical Council has come to require, in the new curriculum, instruction in diseases of the eye, refraction, and the use of the ophthalmoscope—requirements which have been in great measure forestalled at many medical schools, though uniformity of instruction and examination has been lacking. The licensing bodies are at present organizing courses.

Venereal Disease.—The 190 clinics now established for free treatment are available for the education of students. The subject is compulsory, and as an example of a course of instruction a scheme suggested by experience at the St. Thomas's Hospital clinic is set forth in the Memorandum. It includes bacteriology, pharmacology, demonstrations, lectures, and clinical work. The value of ante-natal treatment for both mother and child should be impressed on the student.

Dental Education.—Sir George Newman presents a lucid sketch of the facts and considerations which have gradually but inevitably led up to the new dental curriculum and the new *Dentists Register*, as well as to the penal prohibition of unregistered practice. The aim of the Council in the new scheme is to provide "a minimum curriculum without impairing the standard of efficiency." The revised curriculum is given in full in the Memorandum, and it is affirmed that "dentistry may now become, for the first time, an organized instrument and means of preventive medicine." The new *Register* includes 13,000 names.

Public Health.

As long ago as 1868 the British Medical Association urged the General Medical Council to consider the qualifications required for holding office in what has now developed into the public health service of Britain. The Medical Act of 1886 conferred on the Council the power to register such qualifications, and recognition was given to certificates or diplomas which had already been granted by licensing bodies. Later there came the statutory requirement that for some offices such diplomas were to be essential, and so, under rules issued by the Council, the organization developed. The rules have now been revised and strengthened, and, so altered, take effect as from the beginning of 1924. They are based on the Council's agreement with the dictum of Dr. Bruce Low in his report of his inspection of the D.P.H. examinations throughout the United Kingdom, that "it is of national importance that weak or unsuitable candidates should, as far as possible, be kept out of the Public Health Service of the country." The scope of study includes maternity, infant, and child welfare, tuberculosis, venereal disease, occupational and food-borne disease. The candidate is required to work with a medical officer of health for not less than six months, and "must go and see and learn the practice of the branch of medicine he has chosen to follow;" also he will not be allowed to obtain his diploma until a minimum of two years after his qualification in medicine, so that there shall be at least an opportunity for some development of maturity of thought and outlook, in whatever department of study and practice the interval be spent, whether in a laboratory, a hospital, a dispensary clinic, or sanatorium, assistantship in general practice, or other medical occupation. The new rules are quoted in full in the Memorandum, and it is pointed out "that Part I is analogous to the intermediate sciences in the medical curriculum, and Part II to the clinical art of applying these in practice."

Conclusion.

Sir Clifford Allbutt wrote in 1919: "It is revealed to us that Medicine has come to a new birth . . ."; it has changed "from a craft of tradition and sagacity to an applied science of analysis and law; from a descriptive code of surface phenomena to the discovery of deeper affinities; from a set of rules and axioms of quality to measurements of quantity." After the mediaeval centuries of darkness, Sir George Newman writes, "the new day dawned in 1543, when Vesalius published his *Fabrica* at Basel and Copernicus his famous book at Nuremberg on the revolution of the planets round the sun;" and the Memorandum goes on to give a rapid sketch, mentioning the introduction of the stethoscope and the beginnings of physiology, pathology, anaesthesia, bacteriology, protozoology, immunology, asepsis, internal secretion, and cardiology. "The representatives of medicine and science have thus come to the aid of the nations, to the succour of the human race." Within our own time we have seen the advance of public medicine, the organization of research, the growth of medical and surgical treatment, and the reform of medical education. The training of the physician affects the well-being of the State, but he is also the trusted confidant of his patient, and on this ground his education and his function must be individualistic. The inspiration of reform is the prevention of disease. "Curative medicine and remedial surgery must have immediate priority, but the ultimate goal is prevention." The future of medicine in England depends not merely on proper training to obtain a registered qualification, but "upon continued education after graduation." Four requirements are emphasized in the conclusion, and may be condensed thus:

(*a*) The necessity of integration in the medical course and avoidance of overburdening the student with details, so that he may "reflect and comprehend and grow." The teacher should be an *educationist* and realize this.

(*b*) Clinical study must remain the sheet-anchor of education. Instruments and apparatus should be only supplementary to observation by the organs of sense; final judgement should depend on acumen and competence.

(*c*) The load of examinations should be lightened, notwithstanding the good purpose and competency of examiners; "the system remains a shackle upon medical education," and the student's course is standardized not by love of learning, but by the prescription of the examining body. In 1922 the General Medical Council resolved that "In the regulations for the several examinations it should be provided that examiners, in assessing marks, be empowered to take into account the duly attested work done by the candidate throughout his course of study in the subject of the examination."

(*d*) Post-graduate courses are necessary to keep the practitioner informed of new medical knowledge and its applications. In London a central scheme is necessary for the graduates of the twelve schools, and for medical men from the colonies and foreign countries. Other countries have much to learn from us and we have much to learn from them.

Financial assistance from the Treasury to medical education is justified, and the Memorandum contains evidence of its wise and economic use. Notwithstanding all that has been accomplished, the author of the Memorandum holds that the present reform movement in medicine is only at its beginning. No doubt he is right, and his own present contribution to the movement will, by informing the profession and the public of what is being done and what is being aimed at, give new and very valuable stimulus to the progress of which he makes himself the chronicler.

British Medical Journal.

SATURDAY, MAY 5TH, 1923.

SYPHILIMETRY.

OUR Paris Correspondent referred a few weeks ago (p. 652) to a system of controlling the effects of anti-syphilitic treatment devised by Dr. Vernes and described by him in a series of communications to the Académie des Sciences. He has in Paris an Institut Prophylactique, where a large number of cases are dealt with, and, as our correspondent mentioned, a public appeal has been launched in France, with very influential support, to defray the cost of adding to the prophylactic institute a teaching establishment where medical practitioners can make themselves acquainted with the details of the method Vernes recommends. It should be said that the method does not command universal approval in France and has not been generally adopted by syphilologists and pathologists. Indeed, recently, a number of syphilologists issued a counter-manifesto criticizing the grounds upon which the appeal is being made. The method has been briefly mentioned in our columns,* but it has not hitherto attracted much attention in this country, and an account of it may be of interest.

In the first place it is to be observed that the limitations of the Wassermann test are well known and are particularly felt when it is desired to know how far a given course of treatment has gone towards eradicating syphilis. Attempts to solve the problem have been made; for example, Weichardt, in his epiphanin test, and Ascoli in his meiostagmine test, made use of the alteration in surface tension of certain substances which occurred when mixed with syphilitic serums. Others, notably Sachs and Georgi, Meinicke, Kolmer, and Dreyer and Ward (Sigma test), have relied upon the flocculation which occurs when syphilitic serum is added to organic extracts in correct proportion.

In Vernes's test suitably diluted "péréthynol" (an alcoholic and ethylene dichloride extract of horse heart) is used, and the flocculation produced is measured. The péréthynol is so prepared that when mixed with distilled water under a given set of conditions a colloidal suspension is obtained of definite uniform opacity. This suspension is adjusted to give no flocculation with a normal serum and varying degrees of flocculation with a syphilitic one, the amount of flocculation being proportional to the intensity of the infection. In order to measure the degree of flocculation he originally added pig serum, which interferes with the flocculation of a péréthynol-syphilitic-serum mixture, and in doing so loses another property it possesses—namely, the power to dissolve sheep's red corpuscles. The measure of haemolysis is therefore inversely proportional to the original flocculation, so that no haemolysis indicates a strong reaction, and complete haemolysis no reaction between the tested serum, the péréthynol, and the pig's serum. More recently he has adopted the method of measuring the flocculation directly by an opacimeter, thus dispensing with the pig serum and the red cells. A reading is taken by comparing the amount of light cut off by the opacity of the fluid in the test proper (serum and péréthynol) and that by a control (serum and alcohol in distilled water). The difference between the two is read off on a scale and referred to a table which gives the weight of precipitate in milligrams per cubic centimetre. This method promises a much more exact means of measuring flocculation than the naked eye or hand lens commonly employed in other flocculation tests. The instruments for measuring and delivering the various quantities of the reagents, and for their preparation, and, above all, the optical instrument for estimating the amount of flocculation, are models of ingenuity, but the cost of the installation of the apparatus for the performance of the test must militate against its adoption, except where very large numbers of tests are to be made.

Vernes claims that the direct measurement gives a far wider range than the indirect. The diagnosis does not depend on a single test but on the curve which is plotted out from the degrees of reaction discovered in a series of tests. Vernes claims that by his test the patient's progress can be measured accurately and cure determined eventually with complete certainty.

If, following arsenical treatment, the patient is going to relapse serologically the relapse occurs usually from the second to the fifth month, rarely during the sixth, and very rarely during the seventh. If there has been no reaction in serum on eight monthly tests following suspension of treatment and if it is negative also in the cerebro-spinal fluid the patient may be considered permanently cured. Vernes states that in a very large number of cases, extending over a long period, he has never seen an exception to this rule. Children conceived by parents who satisfy these conditions have never in his experience shown clinical or serological evidence of syphilis; moreover, a person who has fulfilled them may contract syphilis anew.

Dr. Vernes does not appear to employ any unusual remedy, but insists that it is the rhythm of the treatment rather than the amount which is of importance, though he does not make clear exactly what he means by rhythm—that is, how he decides on the amount and spacing of his doses of arsenobenzol. The treatment is controlled by the test, and when the serum has been brought to give no flocculation with péréthynol a test is carried out each month; if the reaction tends to return more treatment is indicated.

Though, as has been said, syphilimetry has attracted little attention in this country, a certain amount of work on it has been done in America, notably by Cornwall and Aronson. The former reports the results of comparative Wassermann and Vernes tests on 232 serums and 130 cerebro-spinal fluids. The tests on serums agreed in 68 per cent., the balance of 32 per cent. being in favour of the Wassermann in 25.5 per cent. and in favour of Vernes in 6.5 per cent. Of the 130 cerebro-spinal fluids the results agreed in 80 per cent.; of those disagreeing the balance was in favour of Vernes in 16 per cent. and of Wassermann in 4 per cent. More recently in France cases have been reported in which the Vernes test was positive in non-syphilitic cases and negative in florid secondary cases. At a meeting of the Société française de Dermatologie et de Syphiligraphie on November 9th, 1922, Leredde reported three cases of undoubted active syphilis in which the Vernes test was negative, and his evidence was supported by Ravaut, Gougerot, Flaudin, and Pinardo.

If syphilimetry is all that its author claims for it, it is certainly very attractive; but in view of the above, and until the test has been confirmed by a number of well qualified observers over a considerable period of time, it must be accepted with caution.

The need for caution is confirmed by the terms of the manifesto to which we have already referred; it was signed by a large number of leading syphilologists, and was published in the Paris newspapers evidently as an answer to the statements made in the appeal for funds

* The main features of syphilimetry are to be found in the *Atlas de Syphilimétrie*, by Dr. Arthur Vernes, a review of which appeared in the BRITISH MEDICAL JOURNAL of June 11th, 1921 (p. 857). The optical apparatus for measuring the flocculation has been described by Vernes in *La Presse Médicale*, No. 97, December 3rd, 1921 (Mesure Pondérale de la Floculation par la photométrie par Arthur Vernes).

The manifesto states that the signatories consider it their duty to call the attention of the public to certain points. The first is that the method of diagnosis called flocculation is not new, is not superior to other methods of sero-diagnosis of syphilis, and even appears in a number of cases less sensitive and trustworthy; secondly, it is pointed out that it is an established practice to follow the evolution of syphilis by the study of serological reactions and to judge the effects of treatment from them, but that it is neither possible nor safe to measure the degree of syphilitic infection numerically. The signatories also consider it imprudent to assert that syphilis has been cured because the flocculation test and other laboratory controls remain negative for eight months. Their general conclusion is that the prophylactic institute is applying neither a new method of diagnosis nor methods of treatment superior to those employed by other doctors.

THE PSYCHOLOGY OF DREAMS.

THE substance of a series of lectures delivered by the late Dr. W. H. R. Rivers at Cambridge and elsewhere has been published in a volume entitled *Conflict and Dream*.[1] It is fortunate that the manuscript of these lectures was left in a form which made it possible for Professor G. Elliot Smith to prepare it for publication; otherwise the psychologist would have been deprived of a thoughtful contribution to one of the most obscure problems of mental life. The pleasure of reading this particularly clear and interesting book on dream psychology must inevitably be tinged with regret that the author did not live to continue investigations so full of promise.

Study of his own and other persons' dreams led Rivers to accept, though with important modifications, Freud's scheme of the processes by which the dream is produced. He makes this scheme the starting point of his discussion, and subjects Freud's theory to criticism from various points of view. The essential and most original feature of Freud's teaching is that dreams as a whole have a meaning, and that their psychological origin can be traced with certainty and precision by means of his psycho-analytical technique. Such a view is in striking contrast to that previously held by most psychologists—namely, that the dream is an anarchical and chaotic revival of memory images to which no meaning can be ascribed. Though some dreams are difficult to explain causally, the view that they are motivated by unconscious tendencies, as are the thoughts and actions of waking life, would appear to be reasonable, in spite of the seemingly meaningless character they present. The same forces which impel the individual into ceaseless mental and physical activity during the day may be assumed to seek expression, and to control the thought processes, during sleep. Dr. Rivers accepts this view without hesitation, but arrives at the meaning or latent content of the dream by a method which differs from that utilized by Freud in his interpretations. In an interesting chapter he criticizes the method of free association as an instrument for elucidating the meaning of the dream. He does not question the value of the psycho-analytic technique as a method of diagnostic value, but he doubts whether the thoughts reached by the process of free association have necessarily taken a part in determining the dream.

When Dr. Rivers began to analyse his dreams he discovered that as soon as he became awake he was already having, and had for some time been having, thoughts about a dream, the dream itself being still clearly in his mind. He regards this unwitting or partially unwitting method of analysis as one especially likely to lead one to the real thoughts and emotions forming the latent content of the dream. By following this procedure he found that the dream images merged by insensible gradations into waking thoughts, and the solution of the dream came in a more or less spontaneous way. Dr. Rivers felt that the interpretations given by Freud were forced and arbitrary, and his own investigations led him to criticize Freud's dream formula as unduly simple and as an inadequate expression of the relation between the manifest and latent content. Basing his view on the personal study of dreams, a number of which are described in this volume, he suggested, as an alternative to the wish-fulfilment theory, the hypothesis that the dream is the solution or attempted solution of a conflict which finds expression in ways characteristic of different levels of early experience.

The essential difference between this hypothesis and Freud's is the stress laid on recent conflicts in the motivation of the dream. According to Dr. Rivers, while the structure of the dream is infantile and primitive, it is determined by adult interests; putting the matter in very simple language, it may be said that the opposing impulses and troubles of daily life continue to preoccupy the individual during sleep, though expressed in a disguised, grotesque, and fantastic form. On the other hand, though Freud recognizes that recent, superficial, and conscious wishes take their part in the dream, he considers that they do so only in so far as they are associated with a primitive, infantile, repressed tendency of which the individual is normally unconscious. From the standpoint of Freud the dream is to be regarded as the distorted expression of a primitive impulse seeking only its own ends; he holds that the process of dream-making involves no intellectual operations, has no constructive value, is non-creative, and reaches no conclusions. Rivers, on the other hand, regarded the dream processes as more allied to the thoughts and behaviour of waking life. He found that dream thoughts are primarily concerned with the external situations of daily life; the tendency to harmonize conflicting interests, to develop new and useful combinations of images, and to find solutions, he regarded as characteristic of the dream consciousness as it is of the waking. He describes a number of dreams in which he detected evidence of a constructive process, and suggested that the dream may be capable of solving or helping to solve practical problems which may be presented in the course of daily life, and, though in symbolic and fantastic form, may express conclusions better than those reached in daily life. He explained the superiority in this respect of the state of sleep to the waking life on the hypothesis that during sleep the conflict between opposing impulses is free and open. One impulse is not thwarted by another as when awake; both have equal play, so that the imagination can apply itself without restraint to finding a solution of the conflict.

This theory of the dream as the solution or attempted solution of a conflict he applied to the elucidation of the difficult problem of the affect in dreams. Briefly, the view taken is that the different degrees of painfulness of the affect depend on different degrees in which the dream forms a successful conclusion; in dreams accompanied by no appreciable affect a satisfactory solution of the conflict upon which they depend has been reached, but where the solution of the dream is completely unsuccessful there is an affect of a highly painful kind. Rivers was in agreement with Freud that the effect of transformation of the latent content is to diminish the affective aspect of the conflict, and that where there is considerable transformation there is little affect; but he did not accept the explanation of this transformation—or, as Freud prefers to call it, distortion—by reference to

[1] *Conflict and Dream.* By W. H. R. Rivers, M.D., D.Sc., LL.D., F.R.S. With a Preface by G. Elliot Smith, F.R.S. London: Kegan Paul, Trench, Trübner, and Co., Ltd. 1923. (Pp. xi+195. 12s. 6d. net.)

the agency of the censorship. He supposed that the relaxation of higher mental levels during sleep permits earlier levels of mental activity to function, and thus, though the dream is concerned with recent conflicts and external situations, its structure is primitive, regressive, and infantile.

Rivers in these lectures gave only brief consideration to the relation of dreams to pathological mental processes, myths, and the products of artistic activity. Here he touched on very big problems, and was only able to deal with them in a cursory manner. He believed that in mental disorder, as in dreams, the importance of early experience has been greatly exaggerated by Freud and his followers, and he ascribed considerable pathogenic significance to recent conflicts in the production of abnormal mental states. Except in a limited number of cases this view would scarcely seem to harmonize with the facts of clinical experience. If it were generally applicable the psycho-neuroses would be much more amenable to treatment than is actually the case, and it is doubtful whether any but the mildest cases are the outcome of superficial conflicts and external difficulties, though such factors, no doubt, have a certain influence in provoking more pronounced episodes of inadequacy in habitually neurotic persons.

In an interesting and important lecture on symbolism and dreams Rivers subjected Freud's theory of universal symbolism to criticism. Freud believes that the fundamental and perennial interests of mankind re-create afresh out of individual material stereotyped symbols, and that, while many of these symbols cannot be interpreted by the method of free association, their meaning can be supplied from a knowledge of myths, folk-lore, and primitive beliefs. The arguments advanced by Rivers against this view are based on a study of his own dreams, in which he shows that symbols have a variable interpretation, and on his ethnological researches. The latter led him to believe that no systems of symbolization are of universal distribution, and that the so-called innate symbolism is the result of a common tradition so prevalent that it influences every member of the community, and becomes, perhaps at an early stage of his life, part of the furniture of his mind. He was thus led to the conclusion that the tendency to symbolize certain thoughts by means of the same symbols, or by symbols having a close similarity to one another, is not instinctive but acquired; it is part of the "social heritage." His views on this subject have been expressed more fully elsewhere in various papers, and it is to be hoped that these also may be collected in a book.

COUNTRY LIFE AND COUNTRY DOCTORS.

MR. LLOYD GEORGE—who has the knack, if we may use the expression without offence, of putting into words thoughts which other people are beginning to formulate—enumerated in his address to young liberals at Manchester last week certain matters in which the English and Welsh, if not the Scots, were wasteful. One was waste of health and its attendant energy by bad housing, about which, in large towns at least, there is little room for doubt; another was waste of coal, and it is certainly wasteful to pollute the air by turning tons of combustible material into it, but this probably was not what he was thinking of. Another was the waste of brain power for lack of education, about which until he will define the meaning of education in this connexion there is room for two opinions; and the fourth was the wasteful misuse of land. He quoted Lord Ernle for the assertion that Belgium raised five times as much to the acre, and Germany twice as much, as Great Britain. Mr. Lloyd George, true to the political doctrine he has often preached before, believes that a change in the land laws would be a remedy. But it is strange that under these laws Great Britain has been able to breed the best cattle, sheep, and pigs in the world, as is proved by the prices given by foreign buyers for pedigree animals. He went on to say that the population on the land is diminishing decade by decade, whereas in other countries—he mentioned Belgium, Denmark, France, Holland, and Germany—it is increasing. To consider whether the last clause is strictly accurate or not would take us too far, but there is no doubt that our rural population is decreasing, and we are glad that a leader of Liberal political opinion should have so quickly come in to endorse and reinforce the thesis Dr. Williams-Freeman so ably maintained from a particular point of view in the brilliant little essay published in the SUPPLEMENT on April 21st. The country doctor is friend and helper through all the countryside; he suffers with the rural community, and it suffers in its dearest interests and in its efficiency through the handicap under which he works. Mr. Lloyd George was the father of the Insurance Act, which worked something like a social revolution; it was impossible to foresee all its effects, but its most ardent advocates did not assume that its working would not disclose defects. We feel sure that Mr. Lloyd George at any rate did not. Will he not look into this matter of the plight of the country doctor, and use his great influence to see that justice is done to him and to the country people among whom and for whom he works? No great sum is needed, and the coffers of the Insurance Commission are perhaps fuller than some would have us believe.

THE OPHTHALMOLOGICAL SOCIETY'S CONGRESS.

THE annual congress of the Ophthalmological Society of the United Kingdom was held under the presidency of Mr. Maitland Ramsay, of Glasgow, on April 26th, 27th, and 28th. There was a large attendance of members and many interesting papers were read. The proceedings opened on Thursday, the 26th, at the Royal Society of Medicine. After the President's opening address, Mr. Treacher Collins and Sir William Lister each contributed a paper on that interesting and somewhat rare condition of angeoid streaks in the fundus oculi. Then followed papers by Mr. Affleck Greeves and by Mr. Foster Moore upon their results of cataract extractions by Barraquer's method. Since Barraquer first published an account of his method its value as compared with older and more tried methods has been much discussed. In the afternoon a discussion on the disorders of the blood and their ophthalmological manifestations was opened by Sir Humphry Rolleston, Sir Frederick Andrewes, and Dr. W. C. Souter. At 5 o'clock there was a large gathering to hear Professor George E. de Schweinitz deliver the Bowman lecture on "Certain aspects of pituitary body disorders mainly exclusive of the usual central and peripheral field defects." Professor de Schweinitz held the large audience spellbound by his oratory. The lecture was illumined by the results of much careful anatomical research of the pituitary body and its immediate anatomical relations, and contained many interesting suggestions as to the various probable and possible ways by which the optic nerve fibres might be involved by irregularities of the anatomical, physiological, and pathological conditions of the gland. This year's Bowman lecture will take a very high place in the records of this famous institution. The members dined together in the evening at the Langham Hotel. On Friday morning a discussion upon the diagnostic significance of proptosis was held. It was opened by Mr. Wilfred Trotter, Mr. Herbert Fisher, and Dr. Angus MacGillivray. Many members took part in the later stages, and the chief divergence of opinion appeared to arise with regard to the treatment of those cases of proptosis which were due to arterio-venous communications in the cavernous sinus. Papers by Mr. Holmes Spicer on "Secondary corneal opacities"—a subject particularly his own—and by Mr. Williamson-Noble on "Macular changes in thrombosis of the central retinal vein" followed. In the afternoon a clinical meeting was held at the London Hospital, where cases of interest were shown. In the evening a long list of papers and demonstrations had been arranged. They were of much

interest and covered every line of thought and research in ophthalmology. On Saturday morning, after the business meeting had been held, the proceedings opened with a paper by Dr. Angus MacGillivray on "Enucleation of the eyeball under local anaesthesia." This paper produced much discussion and reminiscence from the members of the society. Mr. Leslie Buchanan followed with a paper on a new subjective visual phenomenon connected with neuralgia. Papers by Mr. Percival Hay on the working distance of patients with moderate and high myopia after correction; by Mr. Humphrey Neame, on the results of further investigations on the passage of arsenic into the aqueous humour after intravenous injections of novarsenobenzol in rabbits; by Mr. Inglis Pollock on a case of pseudo-glioma; by Mr. Lindsay Rea, on ocular syphilis, with special reference to the treatment of interstitial keratitis; and by Mr. Alexander, on a theorem generalizing the optical problems of ophthalmoscopy and skiascopy, followed. The proceedings then terminated.

ACUTE SYMPTOMS AFTER GASTRO-ENTEROSTOMY.

SEVERE acute symptoms after gastro-enterostomy are usually explained by mechanical obstruction of the jejunum distal to the stoma. But that similar severe toxic symptoms may follow gastro-enterostomy without such obstruction is shown by three cases investigated by Haden and Orr,[1] who argue that an intoxication of the same nature as that elucidated by G. H. Whipple in intestinal obstruction may occur when impediment to the outflow of the contents of the blind duodenum allows toxic substances to be formed in a part of the intestine where absorption is rapid and complete. The symptoms and the changes in the blood and urine observed—namely, very high non-protein nitrogen and a well marked increase in the nitrogen excretion by the kidneys—were identical with those in intestinal obstruction. Renal insufficiency appeared to be ruled out, and the increase of the non-protein nitrogen in the blood and of the urinary nitrogen was ascribed to breaking down of the body protein by the toxin. One case showed well marked alkalosis and the other two, in which this investigation was not undertaken until the acute stage of the intoxication had passed, presented a high normal level. In the two cases in which the urinary chlorides were examined there was a very striking suppression of chlorides in the urine, the plasma, and the blood as a whole, which resembled that observed in pneumonia and ascribed by Whipple to the influence of a proteose intoxication. This metabolic change was obviously closely related to the alkalosis, and might be due to fixation or utilization of the chlorides in the process of protein destruction, the sodium ion being thus free to combine with CO_2 and to circulate as sodium bicarbonate with the production of alkalosis. It is possible that the utilization of chlorides in the process of protein destruction is protective, and that the administration of a sufficient amount of chlorides to keep the blood chlorides at the normal level may be effective in combating the intoxication. The authors have started an experimental investigation on dogs to determine the part played by the chlorides in these intoxications, and their results as bearing on practice may be anticipated with interest.

ESTIMATION OF SUGAR IN BLOOD.

THE memorandum of the Medical Research Council published on April 21st (p. 695) announcing that insulin was available for purchase stated that the manufacturers will be directed during the present period of restricted production to supply insulin only to those hospitals and to those registered medical practitioners who have proper facilities at their command for making accurate blood-sugar determinations. Consequently each hospital and practitioner supplied will be required to undertake, among other things, to make a careful correlation of the diet, of the blood-sugar changes, and of the insulin dosage in each case. In this connexion we would call attention to a paper in the current number of the *Biochemical Journal* by Dr. E. G. B. Calvert, who describes a method of estimating the amount of sugar in blood which he has found rapid and reliable. He claims that the number of manipulations has been reduced to a minimum, and that the method is, therefore, particularly valuable in routine clinical work. It is founded upon the methods of Folin and Wu and Mackenzie Wallis and Gallagher. The amount of blood required can be obtained from a single prick of the finger and is greater than can conveniently be obtained by the blotting paper hitherto in general use. The blood is collected in a small platinum capsule of special design, the weight of which is known and remains constant. The capsule with the contained blood is weighed on a torsion balance, and capsule and blood are at once dropped into a short wide test tube containing distilled water, with which it can be completely mixed by a few turns of the test tube. As in other methods, the power of glucose to reduce an alkaline solution of copper is utilized. By the addition of phosphomolybdic acid to the cuprous oxide so produced a clear deep-blue solution is obtained, any unreduced copper being at the same time decolorized. The depth of colour is a measure of the amount of reduction, and consequently of the percentage of sugar present. This estimation has hitherto been made by comparison in a colorimeter with the depth of colour similarly produced from a solution of glucose of known strength. Dr. Calvert has replaced the standard solution by glass discs of the same shade and colour as the solution. A curve of correction for copper reduction is provided, and by its use an appreciable if not considerable error in the estimation of sugar is eliminated. It is claimed that the accuracy of the method is high, as the fullest use is made of the blood available, and that the method is so simple that estimations for several blood curves can be made concurrently.[1]

A JOURNAL OF HELMINTHOLOGY.

WE have received the first number of the *Journal of Helminthology*, which is being edited by Professor R. T. Leiper, and published from the Helminthology Department of the London School of Tropical Medicine. The subscription price for the annual volume containing five parts is 25s. The journal will appear bi-monthly and is primarily intended to provide for the prompt appearance of original papers and other communications written by the staff and associated workers of the various sections of the Department of Helminthology. The first number, which bears the date March, 1923, contains about forty-eight pages. Dr. A. J. Hesse writes on the development of *Bunostomum trigonocephalum*, a common nematode parasite of sheep; it is a close ally of the ankylostome, but Dr. Hesse shows that it is not capable of invading the host through the skin. Dr. G. M. Vevers contributes two articles. The first deals with the lung flukes (*Paragonimus*); a study of the cuticular spines and the size and shape of the eggs leads him to agree with the conclusions of Ward and Hirsch, that there are several species of this genus hitherto regarded as variants of *P. westermanii*. A series of figures shows that there are many variations in the internal organs, so that no specific characters can be based upon them. On the other hand, the cuticular spines are remarkably constant in the various species. It would appear probable that more than one species occurs in man. Dr. Vevers's second contribution deals with a number of new parasitic worms found in British Guiana during the visit of the Filariasis Commission in 1920. A study of considerable interest to those engaged in fur breeding in this country forms the basis of a paper by Dr. Goodey and Mr. T. W. M. Cameron, M.R.C.V.S., who have investigated the structure and life history of *Ascaris columnaris*, a common parasite of the skunk. This parasite has grown to be so extraordinarily prevalent on the

[1] Haden, R. L., and Orr, T. G.: *Bull. Johns Hopkins Hosp.*, Baltimore, 1923, xxxiv. 26–30.

[1] Information as to the cost of the apparatus can be obtained from A. Gallenkamp and Co., 19, Sun Street, Finsbury Square, E.C.; the coloured glass discs are supplied by Messrs. Baird and Tatlock, Cross Street, Hatton Garden, E.C.

ranches for skunk rearing started in this country just prior to the outbreak of the war as to have become a serious economic factor. The presence of the parasite appears to give rise to serious deterioration in the fur and produces fatal results when present in numbers. We congratulate the editor on having broken with the fashion of illustrating scientific papers by photographs and on presenting his readers with good line drawings, which are clearer and more informing.

EFFECTIVE RATES OF INCOME TAX.

A WHITE PAPER just issued by H.M. Stationery Office[1] consists of tables which should be of interest to income tax payers. They show in the case of (*a*) single persons, (*b*) married couples without children, and (*c*) married couples entitled to the allowance for three children, the amount of income tax (including super-tax where the total income exceeds £2,000) payable on certain incomes, and the effective rates charged in the £, for the years 1922–23 and 1923–24. The proposed reduction in the standard rate of income tax (from 5s. to 4s. 6d. in the £) for the later period automatically involves a reduction from 2s. 6d. to 2s. 3d. in the £ in the rate of income tax chargeable on the first £225 of an individual's taxable income—that is, the actual income less the allowance in respect of earned income and less the personal allowances and deductions. The following figures show the amounts payable by married couples entitled to the allowance for three children on "earned" incomes ranging from £500 to £3,000, and the effective rate of tax (on incomes up to £250 there is no charge):

Actual Total Income.	Charge for 1922–23.		Proposed Charge for 1923–24.	
	Amount.	Effective Rate.	Amount.	Effective Rate.
£	£ s. d.	s. d.	£ s. d.	s. d.
500	16 17 6	0 8	15 3 9	0 7½
1,000	118 2 6	2 4½	106 6 3	2 1½
2,000	343 2 6	3 5	308 16 3	3 1
2,500	505 12 6	4 0½	458 16 3	3 8
3,000	680 12 6	4 6½	621 6 3	4 1½

In the case of incomes exceeding £2,000 the above figures include super-tax as well as income tax.

M.O.H., CAPE TOWN.

THE South African mail this week brings two announcements regarding the Health Department of Cape Town. The *Cape Argus* of March 17th publishes an article on the forthcoming retirement, at his own request for reasons of health, of Dr. Alfred Jasper Anderson from the post of medical officer of health. Dr. Jasper Anderson arrived in Cape Town on October 1st, 1901, to take up the duties of first medical officer of health of the Cape Town Council; during the previous ten years he had been medical officer of health for Blackpool. With the unification of the Peninsula municipalities in 1913 he was appointed medical officer of health for the larger Cape Town area. The following summary of figures pays an eloquent tribute to his work in South Africa. In 1901 the European death rate was 17.1 per 1,000, and the coloured death rate 37.6. In 1915 the rates were 15.6 and 28.5. The infantile death rate among Europeans has declined during his tenure of office from 136 per 1,000 to 98.3. Although retiring from his association with the municipality, Dr. Anderson will continue to live in Cape Town. The *Cape Times* of March 28th reports a deputation from the Western Province Branch of the British Medical Association to the Cape Town City Council, in regard to the proposed division of the work of the Health Department into two sections. The deputation was introduced by Dr. C. M. Murray. Dr. Darley-Hartley explained that in the Branch's opinion separation of the duties hitherto under the medical officer of health into two branches, curative and preventive, would be detrimental to the public health. The Branch took no exception to this division so far as executive functions were concerned, but felt strongly that the ultimate administrative control should be with the medical officer of health, for the keynote of public health was unity of direction. The resolution he quoted from was adopted unanimously by a meeting of sixty-one members of the Western Province Branch. Dr. Moffat, who followed, spoke of the importance of maintaining one administrative head of all the health departments. The Mayor, in reply, pointed out that the Council last December decided to combine the office of medical officer of health with that of superintendent of the Infectious Disease Hospital; if that decision was to be reversed a unanimous rescinding resolution would be necessary. Dr. Abdurahman, Chairman of the Health Committee, argued against the views put forward by the deputation. The Mayor informed the members of the deputation that their views would be considered by the Council, and the interview closed. Subsequently Dr. T. S. Higgins, who for the past ten years has been medical officer of health for the borough of St. Pancras, London, was appointed to the post of M.O.H. Cape Town.

[1] Cmd. 1850; price 2d. net.

INFANT WELFARE CONFERENCE.

THE National Association for the Prevention of Infant Mortality and the National Baby Week Council are jointly organizing a conference on infant welfare to be held at Carnegie House, Piccadilly, on Monday, Tuesday, and Wednesday, July 2nd, 3rd, and 4th, under the presidency of the Right Hon. Neville Chamberlain, M.P., Minister of Health. The conference will coincide with the National Baby Week celebrations organized by the same bodies. Business will begin at 10.30 a.m. on July 2nd with the President's address, after which a discussion on "The causal factors of infant mortality up to 1 year of age (ante-natal, intra-natal, and post-natal) and their prevention" will be opened by Drs. Eardley Holland, J. S. Fairbairn, Eric Pritchard, and R. C. Jewesbury. In the afternoon the subject of maternity homes and their relation to maternal mortality from childbirth will be introduced by Dr. W. Allen Daley. On the morning of July 3rd Drs. W. G. Willoughby and Mabel Brodie will open a discussion on the scope, staffing, and administration of maternity and child welfare centres; in the afternoon the question, "Is it advisable in urban areas to combine the functions of the health visitor with those of other officers of local authorities?" will be debated; openers, Drs. E. W. Hope and F. Wynne. The morning of July 4th will be given up to a discussion, opened by Dr. Rhoda Adamson, on the maternity resolution passed by the Washington Convention, 1919, and the afternoon to housing in relation to infant welfare. During the conference visits will be made to a number of maternity and child welfare institutions of various kinds in London. Copies of the programme and information regarding fees may be obtained from the honorary secretary, Miss J. Halford (Carnegie House, 117, Piccadilly, W.1). The two organizations arranging the conference are sections of the National League for Health, Maternity and Child Welfare, of which the chairman is Dr. G. F. Still. The League acts as a co-ordinating body and a central clearing house for information. It has a lending and reference library, and is the publishing department for most of its sections. The work of five societies is thus carried out in one office with an interchangeable staff.

INTERNATIONAL CONGRESS OF THE HISTORY OF MEDICINE, 1925.

AT a meeting of the permanent committee of the International Society of the History of Medicine held at Antwerp on April 11th it was decided to hold the Fourth International Congress of the History of Medicine at Geneva, Switzerland, during the third week of July, 1925. The following officers were elected: *President:* Dr. Charles Greene Cumston, Geneva. *Secretary-General:* Dr. A. de Peyer, Geneva (Rue Général Dufour, 2[a]). *President of Honour:* Sir D'Arcy

Power, London. *Vice-Presidents of Honour:* Dr. Edward B Krumbhaar, Philadelphia, U.S.A.; Dr. Tricot-Royer, Antwerp; Dr. J. G. de Lint, Gorinchem, Holland; Dr. Charles Singer, London; and the President of the Medical Society of Geneva for the year 1925.

INDUSTRIAL FATIGUE BOARD.

THE third annual report of the Industrial Fatigue Research Board, dealing with the year 1922, has been published (H.M. Stationery Office, 2s. net). The duty of the Board is to suggest problems for investigation, and to advise upon or carry out schemes of research referred to it by the Medical Research Council; to promote better knowledge of the relations of hours of labour and of other conditions of employment, including methods of work, to functions of the human body, having regard both to the preservation of health among workers and to industrial efficiency. The Board was instructed to seek the co-operation of industries in the fullest practical application of the results of this research work to the needs of industry. The report gives an account of the work of the Board and its several committees during the year. The inquiries fall under three general headings—general investigations, inquiries into industrial problems, and researches in various selected subjects. The bulk of the volume is made up of a series of individual reports, including two by Dr. H. M. Vernon, one on atmospheric conditions and efficiency, and the other on future investigations in the pottery industry.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

Dangerous Drugs (Amendment) Bill.

THE Earl of Onslow, on April 25th, moved the second reading of the Dangerous Drugs and Poisons (Amendment) Bill in the House of Lords. He explained very briefly the provision, pointing out that people who committed purely technical offences were insured against the risk of the heavy penalties, because it was provided that no proceedings for an indictable offence should be instituted without the consent of the Attorney-General or the Director of Public Prosecutions. There was no discussion, and the bill was committed to a committee of the whole House.

Colonial Medical Services.

Dr. F. E. Fremantle asked, on April 25th, whether there is at the present time any difficulty in securing suitable candidates for the vacancies in the Colonial Medical Services, more especially those in the West Indies; what steps, if any, the Under Secretary for the Colonies had taken and proposed to take to secure action in the direction recommended by the report of his predecessor in respect of the medical services in the West Indies; whether, pending amelioration of conditions of service along the lines recommended in the report the Colonial Office proposed to continue recruiting for these services in this country; and, if so, what steps were being taken to advise intending candidates of the difficulties with which they would have to contend if they took up these appointments? The Under Secretary for the Colonies (Mr. Ormsby-Gore) said that there was no serious difficulty in securing suitable candidates for vacancies in the Colonial Medical Services, except as regarded appointments in West Africa and a few other posts for which it was possible to offer only small salaries. Effect had already been given to many of the recommendations regarding the medical services in the West Indies made by the President of the Board of Education when he was Under Secretary for the Colonies, but financial exigencies had prevented the realization of some of his proposals. There was no ground for thinking that the conditions of service in the great majority of the Colonial Medical Services were not satisfactory. Recruitment for these services was being continued in this country, but had been discontinued in the case of a few posts at low salaries in some of the poorer colonies. As full information as possible with regard to the terms and conditions of service was given to all intending candidates.

In reply to a further question by Dr. F. E. Fremantle, Mr. Ormsby-Gore said that the incidence of disease and the rates of mortality in some of the West Indian Colonies were capable of considerable reduction with great economic advantage. The Colonial Governments had given much attention lately to medical and sanitary matters; several had appointed committees of inquiry, and several had lately reorganized their public health services. In this work the Colonies were hampered by commercial depression and by the indifference of sections of the public which did not yet fully realize the profound importance of domestic sanitation. As pointed out in his predecessor's report, co-operation of all sections of the community with the public health authorities was essential to progress.

Dr. Fremantle asked, on April 30th, whether the Colonial Secretary had under consideration any proposals for ameliorating the conditions of medical service in the Windward Islands; and whether he was aware that the conditions had been the subject of memorials from the Grenada Medical Service since 1919. Mr. Ormsby-Gore said that the decision would be reached at an early date, but he was sorry to say that the financial position of the Windward Islands was such as to restrict the possibilities of improvement in the conditions of the medical service.

Dr. Fremantle asked which colonies, and how many individual medical appointments, were affected by the discontinuance of recruitment in this country in the case of certain medical posts at low salaries; how these appointments were now filled by the several colonies; and what were the medical qualifications and nationality of the successful candidates for such posts. Mr. Ormsby-Gore said the question whether a medical appointment should be filled from this country was frequently decided only when a vacancy occurred, and that accordingly it was not possible to state definitely how many individual appointments were affected, but the number was probably between a dozen and a score. The appointments concerned were some of those in the Windward, Leeward, Bahamas, Turks, Caicos, and Cayman Islands. Most of them were filled by local West Indian candidates of British nationality possessing qualifications obtained in the United Kingdom or Canada. It appeared that there were only two medical men in the islands in question whose qualifications were foreign. Dr. Fremantle inquired whether the reason these posts were filled by persons holding American degrees was that the conditions of service were not such as to attract those with British qualifications. Mr. Ormsby-Gore replied that he believed those two doctors with American degrees were British West Indians.

Dr. Fremantle asked whether the Colonial Secretary was still, in the words of the Wood Report, always hampered in recruitment for colonial medical appointments carrying rights of private practice by the absence of sufficient data as to the value of such practice; if so, what steps had been taken by his department to give effect to the suggestion for removing this defect.

Mr. Ormsby-Gore said the value of a private practice must vary in accordance with individual capacity, and such information as the colonial governments were able to supply could be only of limited utility as a guide to the value of the appointment. The passage in the report dealing with this point was referred to the colonial governments concerned for their observations and no specific reply had yet been received. No difficulty had been encountered in the case of any appointment to these colonies since the date of the report. He believed that all that was done was to tell candidates in round figures what the private practice brought in to the previous occupant of the post.

Pensions and Pensioners.

The Pensions Minister stated, on April 26th, that the total number of awards declared to be final during the twelve months ended March 31st was approximately 246,000. In about 128,000 of the cases in which the final award was at the rate of less than 20 per cent. the men were previously in receipt of a conditional pension. He was unable to say in what proportion of these cases the disability was permanent, but only in a minority of not more than one-third of the whole number was the disability certified to be of indeterminate duration, and in most it was a minor injury in a final or stationary condition. The number of final awards in four-year cases in the year ended December 31st, 1922, was 54,600. The number of these cases which were at the rate of 20 per cent. or upwards and under 20 per cent. respectively was not at the outset especially recorded, but for the period for which a record was kept recommendations in favour of permanent pension were in the proportion of six to four recommendations for award of less than 20 per cent. The proportion of the former class showed a steady increase. A great proportion of the permanent pensions which were made "statutory final" were four-year cases. The average duration of final weekly allowances was about 80 weeks. The total number of men under home treatment with allowances is 7,215, and the total number of pensions and final weekly allowances is 707,000.

The Pensions Minister has said, in reply to a question, that in support of a claim made long after a man's discharge, that a disability from which he was suffering was connected with his service, the best evidence was evidence, whether medical or other, sufficient to establish the existence of the disability since discharge. But while this had always been pointed out by the Ministry in its instructions as an ordinary (though not by any means absolute) requirement, it had been clearly laid down that there were cases of latent disease which might not manifest themselves until very long after discharge, but might nevertheless be reasonably held to have been present before that date. The list of diseases of that class was drawn up on the advice of the highest independent medical authorities with the object of indicating that in the case of these diseases specially long periods after discharge could be allowed for the first known manifestation of the disease in order to establish continuous history. The following is a list of the diseases: Pulmonary tuberculosis, twelve months; general paralysis of the insane, eighteen months; subacute infective endocarditis, two years; diabetes, six months; aneurysm, one year; chronic granular kidney occurring in a man under 45 years of age, two years.

Major Tryon has stated also that reduction in the accommodation of the Ministry's hospitals would naturally follow on the decrease in the demand for in-patient treatment for pensioners. A considerable number of out-patient clinics had been established at convenient centres, and were administered by the Ministry, by civil hospitals, or by the British Red Cross Society on an agreed basis.

Board of Control.—Mr. Nevi'le Chamberlain informed Mr. Ammon, on April 25th, that the total gross cost of the Board of Control for the financial year 1922-23 was approximately £470,236, less appropriations-in-aid (fees for licences, etc.) £7,756. The gross cost included grants-in-aid to local authorities and voluntary institutions £408,791, cost of State institutions for mental defectives £26,795, salaries and expenses, etc., of head office staff, £34,650.

Deaths from Small-pox.—In reply to Mr. Scrymgeour, on April 18th, Mr. Chamberlain said that 24 of the 27 deaths from small-pox in England and Wales last year occurred in the outbreak of virulent small-pox in London and the neighbourhood, and that in this outbreak the fatality rate was 23.7 per cent. in the case of vaccinated persons, and 60 per cent. in the case of unvaccinated persons. The age of the youngest vaccinated person who died from small-pox was 43. Seventy-two cases, of which 23 proved fatal, were nursed at the Metropolitan Asylums Board Hospital at Dartford between July 1st and December 1st, 1922.

Accidents at Woolwich Arsenal.—In answer to Sir Kingsley Wood, on April 23rd, who raised a question on the closing of the hospital at Woolwich Arsenal, Lieut.-Colonel Guinness said that an officer of the R.A.M.C. was always available by day and by night, and adequate facilities existed for the treatment of cases of injury pending their removal to hospital. Injured employees requiring in-patient treatment would in future be taken to the Royal Herbert Hospital, about a quarter of a mile distant. Apart from the Arsenal ambulance, always available in working hours, arrangements had been made with the Metropolitan Asylums Board for the immediate supply by day or night of fast motor vehicles. These would be drawn in the first instance from the Brook Ambulance Station close to the Royal Herbert Hospital. In the event of a very serious accident additional ambulances could at once be called up from neighbouring stations. The London County Council ambulances were also available. In his opinion the arrangements which had been made were satisfactory.

Illness from Vaccination.—Mr. Robert Young asked, on April 23rd, whether, seeing that the operation of vaccination was in many cases enforced, the Minister of Health would see that where untoward results ensued compensation for loss of health and employment wages would be paid, seeing that vaccination was *prima facie* in the interests of the community. Mr. Chamberlain said that the Vaccination Acts did not provide for the compulsory vaccination of adults, and he was advised that there was no statutory authority for the payment of compensation out of the rates in the circumstances referred to.

Heart Cases and Dentures.—Major Tryon, on April 19th, informed Mr. Becker where there was no dental disease due to war service but the extraction of teeth was recommended by the Pensions Department as a necessary part of treatment for an accepted disability, it was the practice to supply artificial dentures when necessary in the interests of a pensioner's health. In regard to a statement by Mr. Becker that a man undergoing treatment provided at the National Hospital for Diseases of the Heart, had had his teeth removed as part of the treatment, and the Ministry had refused to supply him with false teeth, Major Tryon said he understood that the need for artificial dentures had not been established in this case, but he was making further inquiries. Mr. Becker asked whether the Minister was aware that a large number of ex-service men had their teeth removed to assist heart treatment and had not had the money to buy dentures. Was the hospital supposed to supply these teeth, though getting only a capitation of 3s. per head? Major Tryon thought he had dealt with the point.

Mentally Defective Children.—Lord E. Percy informed Mr. C. Wilson, on April 19th, that the latest statistical information as to school accommodation for mentally defective children was contained in Appendix F of the report of the Chief Medical Officer to the Board of Education for 1920. In 293 areas for which data had been tabulated there were approximately 28,000 children reported as mentally defective in the category of "feeble-minded." This total included children under the local combined authority. The total accommodation provided in certified special schools for educable mentally defective children was over 16,000. As to the number that still required to be specially examined by school medical officers, Lord E. Percy said that his only information was from the medical officers themselves.

Choice of Disinfectants.—Mr. Chamberlain informed Mr. Becker, on April 18th, that he had no evidence to show that disinfectants totally devoid of bactericidal action were sold to the public. But he was aware that, judged by certain tests, disinfectants sold might differ considerably in their bactericidal power. As at present advised, he was not prepared to adopt the suggestion that a test should be required. Advice as to the choice of disinfectants for particular purposes could generally be obtained from the health officers of local authorities.

Fee for Milk Examinations.—Sir J. Remnant asked, on April 18th, whether the attention of the Minister of Health had been drawn to the representations of the Society of Medical Officers of Health, the British Medical Association and others relative to the inadequate charges authorized by the Ministry for the bacteriological examinations of the various grades of milk under statutory rules and orders, necessitating as it did the services of a skilled bacteriologist and the provision of the necessary material. Mr. Chamberlain said he had received the representations. He was advised that the work was of a routine character and that the cost per sample should not exceed the amount which had been suggested where arrangements were made at the laboratory for dealing with the considerable volume of samples which might be expected to result from the scheme of milk grading.

Nurses' Registration.—In reply to a question as to the alleged growing resentment amongst registered nurses on the ground that the authority of the General Nursing Council for England and Wales had been usurped by medical men the Minister of Health said there was no evidence of any such feeling in the nursing profession, and the marked increase in the number of recent applications for admission to the Register seemed to him to negative the suggestion. The nurse members form two-thirds of the council, and it was within their power to control the selection of the committee. He understood that the chairman of three out of six standing committees were doctors, but he had no information on the other points, and was not prepared to make representations on matters wholly within the discretion of the council. In reply to another question Mr. Chamberlain said that an examination syllabus (Schedule 2) for the general part of the Register would be approved subject to two small modifications accepted by the council. The syllabus would form part of the rules and sufficiently indicated the subjects in wh ch the candidate was required to be trained. The council had decided to make the syllabus of training advisory only as was allowed under Section 3 of the Act.

Education Department Medical Service.—On inquiry by Sir Joseph Leigh on April 20th Lord Eustace Percy stated that the promised co-operation between the Education Department and the Ministry of Health is now effective. The number of medical officers engaged exclusively at the Board of Education is seven.

Health and Unemployment Insurance.—Major Boyd-Carpenter, on April 17th, stated the total cost of administration of National Health and Unemployment Insurance per person relatively as follows: National Health Insurance, 6s. 8d.; Unemployment Insurance, 7s. 1d.

Patent Medicine Stamp Duty.—Major Entwistle asked, on April 17th, whether according to the construction placed by the Customs and Excise Department upon the provisions of the Patent Medicine Stamp Duty Act, 1812, makers of chemical preparation sold under a fancy name, by not claiming proprietary rights, were able to avoid the incidence of the *ad valorem* Patent Medicine Stamp Duty. Major Boyd-Carpenter replied that the question whether any particular medicine was liable to stamp duty depended upon a number of considerations. If particulars of the case in mind were furnished to him he would have the matter looked into.

Answers in Brief.

The Minister of Health has stated that the Village Settlement Scheme for tuberculous ex-service men recommended by the Barlow Report of 1918 was under consideration, and would be discussed with representatives of the British Legion at an early date.

The Hospitals Commission has distributed £421,023 of the Parliamentary grant of £500,000 in aid of the voluntary hospitals. The Commission has not yet made any recommendations as to the necessity for any future grant, or for the continuance of some central body to act as a link between the local voluntary hospitals committees.

The general question of the salaries of health visitors is receiving the consideration of the Minister of Health.

The Minister of Health has stated that the results of treatment and research in the leper asylums in India were being carefully studied in his department and would be discussed at the forthcoming international conference on leprosy at Strasbourg, at which this country would be represented by a medical officer of the Ministry.

The Parliamentary Under Secretary, Home Office, has stated, in reply to a question, that a bill to consolidate and amend the law relating to coroners is in preparation. He was unable to say when it would be introduced.

In reply to a question with regard to the arrangements for persons under remand in prison for mental observation and report, the Parliamentary Under Secretary, Home Office, said such persons were usually put into the prison hospital, but if the accommodation did not allow they were placed in cells provided for this purpose, and were supervised by the hospital officers. These cells were gated, and it was found by experience that they were the most suitable. They were located in special parts of the prison where few persons passed. The extension of the Birmingham scheme (as regards segregation and observation) to other prisons would involve structural alterations and the expenditure of large sums of money.

The number of ex-service men who have received a Government grant to enable them to finish their education at universities or colleges of similar standing in Great Britain is approximately 19,850, of whom up to the present about 10,110 have obtained a degree or diploma.

The number of persons in England and Wales in receipt of Poor Law relief on March 31st, 1923 (including lunatics in asylums) was approximately 1,459,000.

Four prosecutions have so far been instituted under the Dentists Act, 1921.

The Minister of Health will at at an early date discuss with the British Legion the question of village settlements for tuberculous ex-service men.

So far as the Colonial Office is aware no general opium monopoly has been established in Iraq. In 1920 an attempt was made to control the opium traffic by local monopolies in areas where it appeared to need regulations, and there is no news of change of policy. The High Commissioner is to furnish a report.

X RAYS IN DIAGNOSIS.

THE SILVANUS THOMPSON MEMORIAL LECTURE.

THE sixth annual Silvanus Thompson memorial lecture was delivered by Mr. C. THURSTAN HOLLAND, D.L., Ch.M., honorary consulting radiologist to the Liverpool Royal Infirmary, on Tuesday, May 1st.

After a reference to his predecessors—Rutherford, Bragg, Hill, Bayliss, and Lodge—he paid a worthy tribute to the memory of Silvanus Thompson, his work, and his position amongst physicists.

Mr. Holland took as the subject of his lecture, "The influence of *x* rays on diagnosis." Speaking of the Röntgen Society—the oldest of all the *x*-ray societies in the world—the lecturer said it had never been possible to draw a hard and fast line between the purely medical and the purely scientific, and that the society existed, to some extent, in order to bring together all interested in the study of *x* rays so that mutual benefit might result. The co-operation of physicists, manufacturers, and radiologists was practically an essential of advance.

Early Days.

He related how in December, 1895, Röntgen first published the details of his discovery, in a short paper which was remarkable for its lucidity and completeness. In February of 1896 the lecturer had seen some of the early attempts of Sir Oliver Lodge "to take radiographs," the subject being a boy with a pistol bullet in his wrist. After several failures a successful radiograph was obtained; the exposure was one and three-quarter hours, and, as the lecturer characteristically remarked, "Providence alone is to be thanked that no *x*-ray burn followed."

Mr. Holland then gave an account of his early experiences in *x*-ray work. He said: "At the end of May, 1896, I was the proud possessor of a 3-inch spark coil, six Grove cells, and a tube without an anticathode." They survived only a few days, being replaced by accumulators and a Jackson focus tube. At this very early date "Professor Herbert Jackson made possible by this one tube improvement all the beautiful radiographs which we see at the present time."

Mr. Holland then gave an account, with illustrations, of his own work in the early days of radiography, done with an apparatus which cost £30, including the tube. He related that as early as October 2nd, 1896, two boys with coins in the oesophagus were examined; the coins were found and removed. One of the coins had been in the throat for just over a year. The child had been treated for tuberculosis, and had been to many specialists and health resorts. Within a few weeks of the removal of the coin his cough and all his other symptoms had entirely disappeared. Mr. Holland cited this as "one of the first great *x*-ray triumphs of diagnosis." He related how in November, 1896, he examined his first chest case, and in December "my notebook reports that a stomach case was examined, and that the exposure given was one hour."

He gave many examples of the trials and troubles in the early days of radiography, and of how these were successfully overcome. Mr. Holland believed that the influence of *x* rays as regards accurate diagnosis was even yet not altogether realized, and proceeded to trace the development of radiography in the investigation of the various systems of the body.

Diseases of Bones.

He first dealt with the bony skeleton, and showed how from the very first all conditions affecting it had been recognized as a "fair field for *x*-ray diagnosis. . . . The demonstrations of fractures, dislocations, and of disease and abnormalities as they affect bones is such an everyday *x*-ray necessity that it has altogether ceased to be a wonder, and the examinations are made as a matter of course." The lecturer emphasized the value of radiography in injuries adjacent to and affecting joints in the demonstration of cracked fractures of bones in injuries to the small bones of the hand and foot, and showed how the accuracy of diagnosis, wholly impossible in the pre-*x*-ray days, had a great influence on final results.

The results of *x*-ray examination of bone conditions became of greater and greater importance as experience increased; there was no disease affecting bones, whether intrinsic or extrinsic, which did not, in its course, give rise to some *x*-ray change from the normal. In many cases in which the clinical diagnosis was doubtful, the *x*-ray findings became conclusive. He showed, however, that one unfortunate result of this universal application of radiography was the tendency, more particularly in out-patient departments, to rely to such an extent upon the *x*-ray diagnosis that the cases were not properly examined by the student; he emphasized the importance of a thorough clinical examination in addition to the *x*-ray examination.

Foreign Bodies.

He then proceeded to deal with the methods of detection and localization of foreign bodies, paying a just tribute to the work of the late Sir James Mackenzie Davidson.

Diseases of the Urinary Tract.

The lecturer dealt next with the urinary tract. The modern surgery of stone in the kidney and ureter had been the direct result of *x*-ray diagnosis; the first kidney stone shown, and later removed by operation, was reported by Dr. MacIntyre of Glasgow in July, 1896. Mr. Holland gave his own experience in this branch of the work, and stated that at the present day "radiography is the only method of examination which can be relied upon to demonstrate the presence of stone in kidneys or ureters. All other diagnostic methods are merely assistant to *x* rays in the interpretation of doubtful shadows. Radiography is the stand-by of physicians and surgeons. By showing the size, shape, and position of a stone it will often decide the question of medical or surgical treatment. . . . The salient feature of radiography is not the showing of the shadows of those stones—that is an easy matter; it is the difficulty, indeed sometimes the impossibility, of making an accurate differential shadow diagnosis. He gave several examples of exceptional cases, and spoke of the use of the opaque catheter and the injection of an opaque solution into the ureter and kidney. It has been the custom in Liverpool at the Royal Infirmary for many years to place almost implicit confidence in the *x*-ray examination, be it positive or be it negative: at the same time always remembering that in the negative cases the possibility of a small uric acid stone must be borne in mind; and also that in a certain number of cases which show suspicious shadows only, errors of interpretation must occasionally occur, which, in some cases at any rate, are not preventable. . . . Exploratory operation for kidney stone is a thing of the past: this is the triumph of *x* rays in the diagnosis of stone."

Thorax: Pulmonary Tuberculosis.

In dealing with the examination of the thorax by the *x* rays Mr. Holland showed how the present position had not been established without a somewhat bitter fight. He said; "It has taken time to convince the majority of physicians that radiography can disclose with accuracy what cannot be detected by auscultation and percussion; but fact after fact disclosed by *x* rays—striking pictures of pathological conditions, quite unsuspected—occurring day after day, could not be pushed upon one side, and it is now admitted by most physicians that gross intrathoracic lesions may be present which are not diagnosable by the ordinary method, but which *x* rays reveal at a glance in a most dramatic manner." He gave numerous instances of such cases.

The subject of pulmonary tuberculosis was carefully reviewed, and the lecturer gave his definite conclusions:

1. The clinical diagnosis of pulmonary phthisis is in many cases a mere matter of conjecture, one which is not proven by physical signs, and one on which the history of the case has a very significant bearing.
2. That in many cases—and I emphasize the many—in which physical signs are reported to me as being entirely or almost entirely absent, *x* rays disclose a condition of such extensive disease that at the first sight it seems incredible.
3. That in any case of recognized lung tuberculosis the *x*-ray examination will inevitably reveal more than the most skilled clinician without *x* rays can arrive at.
4. The negative value of a properly conducted *x*-ray examination is of the very greatest value.

Gastro-intestinal Tract.

The historical aspect of the *x*-ray investigation of the gastro-intestinal tract was briefly outlined. The lecturer proceeded to describe the triumphs of radiology in the differential diagnosis of oesophageal and gastric conditions. The influence of *x* rays in the diagnosis of intrinsic and extrinsic diseases affecting the oesophagus was discussed, and the

question of the *x*-ray diagnosis of gastric ulcer dealt with. The lecturer entirely agreed with the statement of Sir Berkeley Moynihan that "in the diagnosis of gastric ulcer it has pride of place, in competent hands it is far more accurate than any other method of diagnosis, clinical or chemical, or than all other methods combined." Mr. Holland, in speaking of gastric ulcer, stated that he had seen over 200 cases of hour-glass stomach of every possible variety. Very few had been diagnosed previous to the *x*-ray examination. The importance of *x*-ray examination in all cases of chronic dyspepsia was emphasized, and many illustrative cases were given. He concluded his lecture with a word of warning. He thought that in teaching hospitals a little too much is at present being asked from radiologists. They were often expected to make a diagnosis from the *x*-ray examination alone; this he considered was not fair, and not calculated to advance either the art of radiology or that of medicine.

Conclusion.

X-ray examination was one method used for arriving at a correct diagnosis, and although it was both dramatic and final in many cases in others it was to a large extent influenced in its reading by a knowledge of other facts. "Students are being taught to rely too much upon the *x*-ray departments for their diagnosis, and are neglecting to develop to its full the art of observation and deduction so wisely used by their ancestors."

X rays, he went on to say, have crossed the paths of medicine in every direction, and wherever they have crossed those paths they have left behind beacons of light.

THE IMPORTANCE OF EARLY DIAGNOSIS IN PULMONARY TUBERCULOSIS.

It is a very favourite occupation of enthusiasts in personal and general hygiene to calculate the annual number of deaths which might be averted if only more enlightened principles could be inculcated into the people and a higher standard of sanitation be realized in their environment, as, for instance:—To what extent the infantile mortality might be reduced if a perfectly safe milk supply could be ensured? What would be the effect on the longevity of the workers were certain factory defects removed? How many lives would be saved in tropical countries if the tsetse fly could be exterminated or the mosquito banished beyond the confines of man? And so on. A very interesting and inspiring pursuit, and one which, by appealing to the imagination of the enlightened, has probably provided a considerable stimulus to the carrying through of valuable reforms in the prophylactic treatment of disease.

The publication by the Medical Research Council of a report on tuberculosis in insured persons accepted for treatment by the City of Bradford Health Committee[1] might well engender an attempt on the part of some of the more speculative members of the community to estimate the yearly saving of lives in the British Isles if all patients developing pulmonary tuberculosis could be diagnosed in the early stages of the disease. Though tempted to give way to a similar impulse ourselves, we feel it better to direct our activities into a more didactic channel, and to give a brief account of the results which have been obtained by Dr. Vallow in the treatment of the poorer social classes affected with tuberculosis at Bradford. In the years 1914–16 the number of persons accepted by the Health Committee for treatment of pulmonary tuberculosis was 584 (342 men and 242 women). These figures comprised patients in all stages of the disease, and were not selected in the way that patients for sanatorium benefit usually are. For the early, and the more hopeful of the moderately advanced cases, sanatorium treatment was adopted; for the advanced cases hospital treatment was given as a preventive measure; and for certain other cases domiciliary treatment was provided. Added to this, the after-care of discharged institutional patients was effectively attended to by health visitors and others, and extra food and clothing were provided for such cases as required it.

Owing to the fact that Bradford forms a complete civic unit, the following up of the patients and the ascertaining of the number of deaths which occurred has been comparatively easy—so much so that only 3.9 per cent. of the patients have been lost sight of. The statistics collected with regard to their after-history have been completed, yielding information for an average of five years in the case of those patients who survived. The classification adopted was similar to that of the Association for the Study and Prevention of Tuberculosis in America, with certain differences to be noted later. The results of a careful analysis of the figures show that of 204 Stage I cases only 3.4 per cent. died; of 158 Stage II cases 55.1 per cent. succumbed; and of 222 Stage III cases the mortality was no less than 99 per cent. If the actual deaths amongst the Stage I cases be compared with the expected deaths amongst the general population of England and Wales—calculated by multiplying the "exposed to risk" by the ratio of mortality for the approximate ages according to the English Life Table No. 8—it is found that the patients in this category enjoy a practically normal after-lifetime. A comparison of the Bradford figures with those of the Midhurst report (Spec. Rep. Series, No. 33) shows that the Stage I cases in the former series do rather better, the Stage II cases much the same, and the Stage III cases, for obvious reasons, very much worse.

These, quite briefly, are the results obtained. There are one or two points to be noted. First, as regards classification. Though the standard adopted was similar to that employed at Midhurst there are certain differences. For instance, in the Bradford Series Stage I cases were restricted to those showing very limited signs confined to not more than one lobe, whereas in the Midhurst series slight infiltration of both apices was permitted. Again, in the former series, to qualify for Stage III a patient had to show extensive signs in three or more lobes, while in the latter series extensive infiltration or consolidation in one or more lobes was required. This means that on the Bradford classification a patient might have disease of the whole of the left lung, and be absolutely moribund, and yet, since only two lobes were affected, he would have to be relegated to Stage II. True, it is unusual to find such extensive disease in one lung without at least some trouble in the opposite one, yet such cases do occur—as all those familiar with artificial pneumothorax treatment will admit. These differences do undoubtedly detract from the value of an exact comparison between the Bradford and Midhurst figures. Again, in calculating the mortality rate, in the Midhurst series all deaths were counted—no matter from what cause—while in the Bradford series, it appears—though the author does not give very definite information on the point—that only those dying from pulmonary tuberculosis were included. Lastly, it is unfortunate that no classification based on the presence or absence of tubercle bacilli in the sputum was made in the Bradford cases.

Leaving aside these points, however, there is a big fundamental fact which stands out pre-eminent—namely, that patients developing pulmonary tuberculosis who are diagnosed in the early stages of the malady, who receive adequate sanatorium treatment, and who then return to their work in the industrial town in which they primarily contracted their disease, enjoy, for all practical purposes, a normal after-lifetime. This is a fact, and amidst the tangled skein of conflicting opinions regarding the treatment of phthisis it is a fact to be firmly grasped. It is a fact which should serve as a guide in the subsequent attitude of the health authorities towards the prevention of tuberculosis. It is a fact which should stimulate every medical practitioner to do his best to recognize the disease before it is yet too late. It is a fact which all those who oppose the present sanatorium treatment of pulmonary tuberculosis have got to face. And it is a fact which should give encouragement to all those whose endeavours have been directed towards providing a rational treatment for the disease—a treatment, moreover, which comprises not merely a few months' rest and training at an institution, but which recognizes the importance of enlisting the help of the social workers so as to ensure the prolonged after-care of the patient and the provision of the best hygienic conditions which the circumstances will allow.

[1] Medical Research Council, Special Report Series, No. 75, His Majesty's Stationery Office, London. 1923. *Tuberculosis in Insured Persons Accepted for Treatment by the City of Bradford Health Committee.* By Harold Vallow, M.D., D.P.H. (Pp. 18. 6d. net.)

THERE has been published in *The World's Health* (a monthly review issued by the League of Red Cross Societies) an account of the conference of Oriental Red Cross Societies held at Bangkok, Siam, towards the close of last year. The conference was presided over by Sir Claude Hill, director-general of the league, who together with Dr. Malcolm Smith acted as delegates of the British and Australian Red Cross. Dr. Norman White represented the League of Nations, Dr. M. E. Barnes the Rockefeller Foundation, and Dr. W. W. Peter the Council of Health Education in China.

England and Wales.

PSYCHOLOGICAL MEDICINE AND RESEARCH AT BIRMINGHAM.

SIR FREDERICK MOTT has taken up his new duties as honorary director of the pathological laboratories of Birmingham City Mental Hospitals, and gave the first of a series of lectures on body and mind at the university on April 26th. Principal C. Grant Robertson, who presided, said that in 1919 Sir Charles Hyde generously founded a lectureship in psychotherapy; a single lecture had been delivered each year by a different lecturer. When, mainly through the instrumentality of the vice-chancellor, Sir Gilbert Barling, negotiations with the Asylums Committee resulted in the provision of funds for research work, the annual lectureship had been converted into one in morbid psychology tenable for three years, and this post had been accepted by Sir Frederick Mott, who, in addition to giving general supervision of the laboratories at his weekly visits, would give a course of lectures. It was hoped that the scheme for research in mental diseases would eventually be extended, and that other public authorities of the Midland area would join and would contribute to its funds and to the facilities for study. Sir Frederick Mott said that he had hoped that another university would have adopted a scheme similar to that instituted in Birmingham, but in this he had been disappointed, and London was without a university school such as had been established in Birmingham. In foreign countries the university would always be found associated with a mental hospital, and a great part of the valuable work coming from Germany in neurology and psychology had been due to that association. There the professor of psychology at the university was nearly always superintendent of the mental hospital.

BRITISH HOSPITALS ASSOCIATION.

The annual conference of the British Hospitals Association will be held in Sheffield on May 31st and June 1st, under the presidency of the Hon. Sir Arthur Stanley. The first business of the conference will be to consider the reference from the last annual meeting concerning the establishment of a central fund for the provincial hospitals. Mr. H. J. Waring, F.R.C.S., Vice-Chancellor of London University, will then deliver an address on "The future of voluntary hospitals from a medical viewpoint," which will be followed by a discussion. In the afternoon there will be a discussion on modern hospital administration, in which Dr. S. S. Goldwater, of Mount Sinai Hospital, New York, will take part. A reception will be held later in the afternoon at the town hall by the Mayor of Sheffield and Sir Henry Hadow, Vice-Chancellor of Sheffield University, and in the evening there will be an official dinner to the delegates at the Royal Victoria Hotel, with Sir Henry Hadow in the chair, and Lord Onslow, chairman of the Voluntary Hospitals Commission, as the principal guest. On the following day the business meeting will be held. Hospital finance will thereafter be discussed; an opening statement will be made by Sir Napier Burnett, Lord Hambleden will give an address on hospital finance in its relation to approved societies, and a discussion will follow. The Master Cutler, Mr. R. W. Matthews, will give a luncheon at the Cutlers' Hall to the speakers and the council of the British Hospitals Association and other leading members of the conference. In the afternoon arrangements have been made for visits to the different hospitals and convalescent homes in the neighbourhood. Official programmes for the conference will shortly be obtainable from the regional secretary, Mr. S. R. Lamb, Sheffield Joint Hospital Council, St. Peter's Close, Sheffield.

THE CARE OF THE INSANE IN LONDON.

In a report presented to the London County Council on April 24th the Mental Hospitals Committee discussed the conclusions of the Ministry of Health Committee which recently investigated Dr. Lomax's charges against asylum administration. Of the ten mental hospitals belonging to the London County Council, three—Hanwell, Colney Hatch, and Banstead—date back for about ninety, seventy, and forty years respectively, and in their older parts do not conform to modern ideals. The Committee states, however, that classification of patients, which is more readily carried out in modern buildings, is the rule in all the London mental hospitals so far as structure permits. At each hospital a deputy medical superintendent relieves the medical superintendent of certain executive duties. The medical superintendents meet the assistants every morning in consultation. Every opportunity is afforded for patients to have private interviews with members of the medical staff. The charges made by Dr. Lomax with regard to prescribing and administration of medicines have no applicability to the London mental hospitals. Facilities exist at all the hospitals for hospital and surgical treatment, and the services of specialists are obtained when considered necessary. The Committee is satisfied that no patients who are fully recovered are detained, but has some doubt whether patients may not be too readily discharged on the application of friends. Every effort is made by up-to-date treatment to bring about recovery. Employment in suitable cases, as well as amusement, is provided, and therapeutic occupation is being considered. With regard to those criticisms by Dr. Lomax for which the Departmental Committee said there was some ground—namely, the number and training of assistant medical officers, the number and training of nurses, and the monotony of diet—the London County Council Committee states that at all its large mental hospitals there is authority to employ, in addition to the medical superintendent, eight medical assistants, many of whom possess a special diploma in psychological medicine; it is a condition of the Council's nursing service that nurses shall train for and obtain the nursing certificate of the Medico-Psychological Association before taking rank as staff nurses; improvements in dietary are being considered, and authority has lately been obtained to make certain meals more appetizing. It is agreed that in classification some account should be taken of home conditions and surroundings, though the mental state of the patient is the chief factor upon which classification must be decided. It is agreed also that preference in future appointments should be given to candidates possessing a diploma or degree in psychological medicine, and that it is desirable that superintendents shall have held a general hospital appointment. Seclusion, it is thought, requires a more precise definition by the Board of Control (a recommendation to that effect was agreed to by the Council), but at the same time the Committee is satisfied that there is no abuse of seclusion at the London mental hospitals. The organization of after-care work needs to be considerably strengthened and extended; and the Committee concurs in the opinion that the provision of facilities for the early treatment of incipient mental disorder without certification would be of great value to the community. In this connexion reference is made to the Maudsley Hospital. The Committee concludes its report by stating that it is anxious that the natural concern of the friends of the patients in its charge (over 18,000) should not be aggravated by groundless apprehensions as to their treatment.

Scotland.

EDINBURGH SUMMER POST-GRADUATE COURSES.

THE syllabus of post-graduate courses to be given at Edinburgh in July, August, and September has been issued. These courses were first given in 1906, were repeated annually till the outbreak of the war, and were resumed in 1919. Though the organization of the various courses and the numbers of graduates attending them have not yet reached the high-water mark of 1913, the present year's syllabus shows a marked advance upon that of any year since the war.

The first course this year is in obstetrics and gynaecology. It will last four weeks, will begin on July 16th, and will comprise clinical midwifery (one hour daily at the Maternity Hospital), clinical gynaecology (two hours daily in the Royal Infirmary), child welfare and ante-natal clinics, and demonstrations of obstetrical and gynaecological pathology. The fee for this course is ten guineas.

A special course on diseases of children will be held from July 30th to August 10th. It will consist of clinical demonstrations on the common and important medical and surgical conditions of infancy and childhood, supplemented by eight lectures on special subjects. Preventive medicine in relation to childhood is also included in ante-natal clinics, child welfare clinics, dental clinics, and venereal disease clinics. The fee for this course is six guineas.

A general medical course, lasting four weeks (from August 13th to September 8th) will fill up practically the whole day from 9 a.m. to 4 p.m. The examination of the

various systems is taken up by members of the Royal Infirmary medical staff as follows: Circulatory system, Dr. W. T. Ritchie; respiratory system, Dr. Fergus Hewat and Dr. H. Whitridge Davies; renal and alimentary systems, Dr. R. A. Fleming and Dr. John D. Comrie; nervous system, Professor Edwin Bramwell; ductless glands, Dr. John Eason; blood, Dr. A. Goodall. There are also clinics upon general medical diseases, infectious diseases (Dr. Claude Ker), dermatology (Dr. Cranston Low and Dr. F. Gardiner), diseases of the eye, diseases of children, venereal diseases, and tuberculosis; as well as demonstrations of medical anatomy, medical side-room work, *post-mortem* examinations, morbid anatomy, and medical radiology.

A general surgical course will run concurrently with the medical course and occupy the same hours daily. The following departments of surgery will be taken up individually: General surgery, Mr. John Fraser; surgery of the kidney, Mr. Henry Wade; abdominal surgery, Mr. Chiene and Mr. Wilkie; venereal diseases, Mr. David Lees. There are also surgical and gynaecological operations and surgical clinics in the Royal Infirmary and Royal Hospital for Sick Children, and demonstrations on surgical anatomy, surgical pathology, and surgical radiology.

A set of special lectures on subjects of general medical and surgical interest have been arranged for those attending the two last-mentioned courses, and include—

Surgery of the large intestine, by Sir Harold Stiles; Diagnosis of biliary infections, by Mr. Wilkie; Estimation of renal efficiency, by Dr. J. D. Comrie; Labyrinthine and intracranial complications of middle-ear suppuration, by Mr. J. S. Fraser; Common disabilities of the foot, by Mr. John Fraser; Mechanism of certain cranial deformities, by Mr. D. M. Greig; The Schick reaction and diphtheria immunization, by Dr. C. B. Ker; Sensitization phenomena in diseases of the skin, by Dr. R. Cranston Low.

During the period of the general courses the following special courses may be attended, at hours to be arranged, by those desiring to do so: Diseases of the Blood, Vaccine Therapy, and Physiological and Biochemical Methods in Clinical Medicine. It is also pointed out that during the summer term (May to July), before the ordinary post-graduate courses begin, there are numerous courses suitable for graduates—namely, Medical Entomology and Parasitology, Diseases of Tropical Climates, Psychology and Experimental Psychology, Neurology, Chemical Physiology, Tuberculosis, Clinical Therapeutics, Venereal Diseases, Surgical Pathology, and Diseases of the Nose, Throat, Ear, and Larynx.

Application for enrolment or for details of the courses should be made to the Secretary, Post-Graduate Courses in Medicine, University New Buildings, Edinburgh.

GLASGOW: CLINICAL MEETING.

The clinical meeting of the Glasgow and West of Scotland Branch of the British Medical Association was held in the Western Infirmary on the afternoon of Tuesday, April 24th, and tea, through the kindness of Dr. D. J. Mackintosh and the managers, was served in the conservatory on arrival. The clinical demonstrations commenced at 4 p.m. and continued until 6.15. They proved most interesting and instructive, and embraced an unusual number of rare conditions. At the close of the demonstrations very hearty votes of thanks were, on the motion of the President of the Branch, Dr. G. Douglas McRae, accorded to the managers and Dr. Mackintosh, and to the medical and surgical staffs, for the trouble they had taken in providing such an interesting and educative programme. The attendance was 115. Thereafter an adjournment was made to the Grand Hotel, where dinner was served under the chairmanship of Dr. G. Douglas McRae. The guests present were Dr. John Stevens (Chairman, Scottish Committee), Dr. J. R. Drever, Scottish Medical Secretary, and Mr. Andrew S. Barr. After dinner and the toast of the King, the Chairman called on Professor Stockman to present the Association prize of £10 to Mr. Andrew S. Barr for the best essay of 5,000 words sent in by students of the Glasgow medical schools on the diagnosis and treatment of jaundice arising from obstruction of the larger bile ducts. The toast of the Branch was proposed by Dr. Drever and responded to by the Chairman. Other toasts followed. During the evening a varied programme of songs and stories was carried through, which added greatly to the enjoyment of the fifty members who attended the dinner.

Ireland.

SUPERANNUATION ALLOWANCES.

THE Ministry of Local Government (Irish Free State) has addressed a letter to the Dublin Corporation with regard to the superannuation allowances for its officials; it will be of much interest to medical officials, who either have recently retired from the public services or are about to do so. In the course of the letter it is pointed out that the principles to be observed in granting pensions are:

(1) Pension should run from the date on which employment definitely ceased.

(2) Normally 1/60th for each completed year of service, with a maximum of 40/60ths.

(3) No pension for employees of less than 60 years of age, or with less than the period of service prescribed by statute, except—

(*a*) In cases of permanent incapacity if the statutory period of service has been completed, but the age of 60 has not been attained.

(*b*) In specially meritorious cases the nominal rate may be increased by the addition of extra years' service not exceeding one-third of the service, but subject to a maximum of two-thirds.

(4) In the case of wage-earners distinction must be drawn between substantive wages and additional war wages, and in the case of salaried officials in regard to bonus. An addition to the pension calculated on the bonus may be allowed subject to half-yearly revision in accordance with the cost of living scale.

If preferred, the Ministry would agree to 75 per cent. of the current cost of living, bonus being included in the substantive salary for the calculation of a fixed pension. No emoluments in the shape of overtime or extra duty pay, or other casual remuneration, are to be regarded as pensionable.

(5) Pensions to be calculated according to statute on the average of the wages of the three preceding years, or on the remuneration at the time of resignation.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

The centenary of Pasteur was celebrated by a meeting of the Academy of Medicine in Ireland at the College of Physicians. Sir Arthur Chance was in the chair, and an address on Pasteur was delivered by Dr. William Fearon, Sc.D. Among those present were Dr. M. F. Cox, President of the College of Physicians; Sir William Wheeler, President of the College of Surgeons; the Most Rev. Dr. Bernard, Provost of Trinity College; and Sir William Thompson. The first ceremony, however, was to confer the honorary fellowship of the Academy on Professor E. Hastings Tweedy. Dr. T. P. C. Kirkpatrick formally presented Professor Tweedy, who, he said, had won both for the Academy and himself an honoured name throughout the world. As Pasteur had taught how to prevent and cure hydrophobia, so Ernest Tweedy had taught how to control that almost equally terrible disease eclampsia, which too often killed both the mother and her unborn child. In the long roll of Irish physicians no name ranked higher than that of Ernest Tweedy. The announcement was received with acclamation.

The Chairman, in making the presentation, said that in one branch of the medical art Dublin held the foremost place; her fame in obstetric medicine was known all over the civilized world. By his original and very valuable investigations, his lucid teaching and his public work, Dr. Tweedy had advanced and maintained the reputation of the Dublin school of medicine. For that they owed him a debt of gratitude, and now they were trying to pay a little of their debt by conferring upon him the highest honour and distinction within the power of the Academy to give; to emphasize the dignity, the presidents of both colleges were present. He hoped that the ceremony would be a happy augury of the time when, strife and destruction over, Irishmen, with their destinies in their own hands, would commence the work of reconstruction. In that work the medical profession would have a heavy responsibility; while the work appertaining to legislative change fell upon other shoulders, there were many problems which could only be solved by the best brains in their profession.

Professor Tweedy, in the course of his reply, said that he fully appreciated that the Academy of Medicine had conferred upon him the greatest honour within its power, and having said that he felt that ambition required no further stimulus. If the honour could be enhanced it had been enhanced by allowing it to fall upon the day on which the Academy celebrated the centenary of one of the greatest scientists of his time, Louis Pasteur.

South Australia.

[FROM OUR CORRESPONDENT.]

MEDICAL LEGISLATION.

THE last session of the State Parliament was happily barren so far as medicine and the allied professions are concerned, nor have all the eggs laid by the legislative goose in former years yet been hatched. The Venereal Diseases Act of 1920 may almost be considered a "dud," for the Regulations under the Act necessary to put it into force have not yet been gazetted, possibly have not yet been drafted. Medical reformers and legislators who so eagerly demanded legislation seem, nevertheless, to be satisfied. In medical circles, however, a determined attempt is being made to have some reform of the maternity bonus. It is generally recognized that it does no particular good to mother or baby, but this, curiously enough, was never suggested by the Labour party, at whose behest it became law, after being turned down by their caucus a few months previously; it was undoubtedly a political bribe. It now costs Australia about three-quarters of a million a year, and the force of the argument (prophetically advanced many years ago by Dr. Hone) that the money might be spent to greater advantage by providing pre-maternity clinics and making a real attempt to lessen neonatal and infantile mortality is beginning to be appreciated.

THE UNIVERSITY AND MEDICAL SCHOOL.

Two handsome bequests have been made for the benefit of the medical school—one of £30,000 by the late Mrs. Marks and the other of property worth at least £20,000 by the late Miss Keith Sheridan, the daughter of an Edinburgh M.D. who came out to Adelaide many years ago, not to practise medicine, but as a journalist. The University Council is considering the relative claims of research and of the foundation of additional chairs, or of medical units, but no plans are yet matured. To justify the devotion of some portion of this income to research, it may be mentioned that Professor Brailsford Robertson has succeeded in manufacturing in the Biochemical Laboratory a preparation of insulin the efficiency of which has already been proved by Dr. De Crespigny in some of his cases.

In the medical school there are no important changes, nor on the staff of the principal hospitals, but there is quite an influx of returned post-war graduates, who besides their military decorations bring with them the F.R.C.S.Eng. or the M.R.C.P.Lond.; it is hoped that openings may be found for their energies. Sir Joseph Verco leaves this week to represent the University at the octocentenary of St. Bartholomew's Hospital, where he was a distinguished student.

THE BRITISH MEDICAL ASSOCIATION.

The Branch flourishes and increases in numbers. It is eagerly expecting the advent of incorporation, so that arrangements may be made whereby it can become possessed of the British Medical Hall. The limited company which owns the property has declared a dividend for the first time, and it is hoped that it may be handed over to the Branch some day free of mortgage. The Listerian oration this year was delivered by Dr. Rothwell Adam, the Emeritus lecturer on obstetrics and gynaecology in the University of Melbourne. The indebtedness of obstetrics to Lister was admirably brought out, and the address was much appreciated. The President of the Branch this year is Dr. T. G. Wilson, the lecturer on gynaecology at the University.

India.

DINNER TO SIR TEMULJI B. NARIMAN.

SIR TEMULJI B. NARIMAN, Sheriff of Bombay, was the guest of honour at a dinner on March 13th given by members of the medical profession in Bombay to celebrate his golden jubilee as a medical practitioner. Major-General W. E. Jennings, Surgeon-General to the Government of Bombay, was in the chair, and some seventy-five medical men, representing the different communities, took part in the celebration. General Jennings presented Sir Temulji Nariman with a silver salver, on which the names of his medical colleagues were to be inscribed.

MILITARY MEDICAL SERVICES.

From an announcement made in the Indian Legislative Assembly, on March 16th, it would appear, according to the *Pioneer*, that the Government has under serious consideration the proposals made by the Esher Committee for the future organization of the military medical services. The Committee recommended that the post of Director of Medical Services should be held alternately by an officer of the Royal Army Medical Corps and the Indian Medical Service. Mr. Burdon said that acceptance of this recommendation would prevent the amalgamation of the appointments of the Director of Medical Services and the Director-General of the Indian Medical Service. The Inchcape Committee apparently considered the possibility of this amalgamation, but found it impracticable as a means of securing economy. Mr. Burdon said that the Director of Medical Services could not give the time required to discharge the duties of the Director-General of the Indian Medical Service in addition to his own.

SURGERY IN MYSORE.

The report for 1921 of the Krishna Rajendra Hospital, Mysore, shows that work of a high standard, particularly in surgery and gynaecology, is being carried out in that hospital. During the year 2,845 in-patients and 56,754 out-patients were treated, while 1,048 major operations and 594 minor operations were performed on in-patients, and 779 minor operations on out-patients. Notes on a number of the more important cases are included in the report, and some of the accounts of extensive gynaecological procedures show that excellent results were obtained. Dr. Mahomed Usman, superintendent of the hospital, deserves commendation for the good work done under considerable difficulties.

Correspondence.

COLLOIDAL PREPARATIONS.

SIR,—In view of the conflicting statements made by Sir William Pope and Professor Clark as to the properties of certain preparations professing to be of a colloidal nature, it may be worth while to give my own experience with a sample of "collosol ferrum." This was bought at Messrs. Martindale's, and the price paid was five shillings for four ounces. It was a clear liquid of a slightly brown colour, such as a very weak colloidal solution of ferric hydroxide would have, although tests by dialysis—to be referred to presently—suggested that the colour had another source, possibly the glucose which Sir William Pope states to be present. Glucose, unless chemically pure, usually gives brown solutions.

The solution was strongly *acid*—10 c.cm. required 3.1 c.cm. of N/10 sodium hydroxide to neutralize it to phenolphthalein. Thus it was even more acid (about N/30) than the specimens examined by Professor Clark; and, one would imagine, not very satisfactory for intramuscular injection. Ferric hydroxide can, of course, exist in an alkaline solution, provided that a protective agent is present. In acid solutions the sugar and gelatin are superfluous. It is interesting to note that ferric chloride solutions remain slightly acid even when shaken with freshly precipitated ferric hydroxide.

In the next place, my sample of "collosol ferrum" gave a deep blue colour with potassium ferricyanide, a faint blue with the ferrocyanide, thus agreeing with those of Professor Clark. It gave also a precipitate with silver nitrate and nitric acid. A preparation which I made for class purposes in Graham's manner by shaking a dilute solution of ferric chloride with freshly precipitated and washed ferric hydroxide in excess gave no reaction with either ferricyanide or ferrocyanide, which is the normal behaviour. If such a solution is precipitated by sodium sulphate and filtered, the filtrate gives no colour with thiocyanate. The ferric ions present are in such low concentration as to be undetected by this delicate test. It is well known that a trace of ferric chloride is necessary for the stability of these sols, but it is present in the non-ionized state, adsorbed by the particles of ferric hydroxide.

But the presence of ferrous or ferric ions does not exclude the possibility that there might be iron in the colloidal state in addition. To test this I submitted the "collosol ferrum" to dialysis against water through a membrane of parchment paper. After two days, equal volumes of the solutions inside and outside the membrane were treated with hydrochloric

acid and zinc in the usual manner, in order to convert any ferric salt present into ferrous chloride and to dissolve any in the colloidal state. Both solutions became clear and nearly colourless, and gave no reaction with thiocyanate. On addition of ferricyanide both became deep blue, and I was unable to detect any difference in the intensity of the colour. If there had been any indiffusible iron in the original preparation, the contents of the dialyser would have contained more total iron than the dialysate. I am bound to conclude that if there was any iron in the colloidal state in the original solution it was only in extremely minute amount. In connexion with Sir William Pope's remarks about the variety of dimensions of the pores in ultra-filters, it is only fair to remember that Professor Clark tested his membranes with congo red, and that my parchment paper was known to be impermeable to this dye, whose particles are too small to be resolved by the ultra-microscope.

As to the presence of particles visible under the ultra-microscope, I have in another place called attention to the fallacy of this test unless account is taken of the concentration of the solutions. It may be to the point here to mention that I found a colloidal solution of the acid of congo-red which contained only one part by weight in about 200 of water had to be diluted 1,300 times before the particles were sufficiently far apart to be seen separately and counted. "Collosol ferrum" ought to be crowded with particles when diluted 130 times. The appearance of a large number in the undiluted state could be accounted for by a trace of colloidal material. It is scarcely necessary to remark that the apparent close packing of the particles is due to their actual size being far less than it seems to be, owing to the large diffraction rings.

Since, as Graham showed, one of the properties of colloidal ferric hydroxide is precipitation by sodium sulphate it would have been possible to make a further test of "collosol ferrum" if protectives had not been added unnecessarily. As it is, however, the absence of a precipitate might be attributed to the presence of sugar and gelatin and would not prove the absence of the colloid.

If the iron were in the colloidal state in this preparation a bottle of four ounces would only contain a single dose, as pointed out to me by Professor Cushny. It is true that claims are made that remedies in the colloidal state are greatly more effective than in true solution, but the evidence is very doubtful, and in any case "collosol ferrum" contains little or no colloidal iron. It is a somewhat costly preparation at five shillings the dose, whatever its nature.

I take it that in the particular case of iron the therapeutic object is to avoid the astringent action of the ionized salts on the stomach. Now these are absent in solutions made in Graham's manner and probably also in the commercial "dialysed iron." But I have not tested the latter.

For purposes of intravenous or intramuscular injection, if such modes of administration of iron are really necessary, it would seem advisable to possess solutions of neutral or slightly alkaline reaction. So far as I am aware, these are only stable in the presence of rather high concentrations of alkali. But this might be overcome by appropriate inert protectives, such as sugar. Sir William Pope reminds us of Graham's observations on this point.

As to the controversy which has excited this lengthy letter, I can only conclude that if Sir William Pope's "colloidal ferrum Crookes" is another name for "collosol ferrum," the preparation which he had in his hands was a different one from those sold to the public. That sold to me was similar in its properties to those tested by Professor Clark.—I am, etc.,

London, N.W.3, April 28th. W. M. BAYLISS.

SIR,—Sir William Pope does me the honour of quoting my name in support of the dignified rebuke which, in your issue of April 28th, he administers to my friend Professor Clark. There are many, no doubt, who have deplored Professor Clark's display of that modernist, scientific spirit, which is so insidiously undermining the reverence for authority, at one time the sure foundation of medical belief. To all such it is a real encouragement to see your columns opened once more to a statement like that of Sir William Pope, made with such calm resistance to the challenge of presumptuous experiment.

But Professor Clark, alas! is rebellious and unrepentant. He still questions, on the strength of his own experiments, the accuracy of a statement which, as Sir William Pope points out, "has never before been impugned." Could scientific presumption go further? Alas! it could. Sir William Pope states that a solution is alkaline; Professor Clark dares not only to assert that it is acid, but to suggest that the question can be settled by a vulgar appeal to litmus paper.

Let us hope, Sir, that Professor Clark, and the British Medical Association which has too thoughtlessly encouraged him, will see the error of their ways, and will abandon such attempts to assert the authority of the experimental method against that of innumerable assertions and advertisements, and, now, of a pronouncement *ex Cathedra Chemica Cantabrigiense*.—I am, etc.,

London, N.W., April 28th. H. H. DALE.

SPACE JUDGEMENT WITH ONE EYE.

SIR,—The very interesting article on monocular and binocular vision by Dr. T. Stewart Barrie, read at the Glasgow Meeting (BRITISH MEDICAL JOURNAL, December 30th, 1922, p. 1260), together with the discussion thereon, opens up a wide view of a subject on which hitherto there has been much misconception. Ophthalmologists and others possessed of binocular vision have laid great stress on the necessity of its possession in order to obtain a stereoscopic effect with its consequent advantage in the judgement of distances and relative positions in space of objects seen. This view appears to have been reached mainly by testing persons who were accustomed to binocular vision by occluding one eye.

As Dr. Stewart Barrie rightly points out, however, people who have long been accustomed to monocular vision have really got the stereoscopic sense, and are as accurate in judgement of distances for ordinary purposes as those with binocular vision. He instances the common fact that a man with one eye can drive a motor car through a crowded street with as much ease as a man with two eyes.

In the next sentence he states that "aviators, for example, should have binocular stereoscopic vision." It is this last sentence in which he appears to me to be inconsistent. Surely the requirements in stereoscopic vision and in the accurate judgement of distances and positions on the part of a motor driver in crowded traffic are far greater than those of an aviator. In any case, it seems to me exceedingly difficult, on any theoretical considerations, to suppose that the parallax or convergence due to the eyes, being some six centimetres apart, could be sufficient to aid appreciably in the judgement of distances when the eyes are situated in an aeroplane travelling at a high rate of speed. Some months ago I had to examine an air pilot who had been flying during the war and subsequently, and who had experienced no difficulty in his spatial judgements, although he only had monocular vision. He had a convergent concomitant squint, seeing 6/5 with the fixing eye and 6/36 with the squinting eye. He appeared to have perfect judgement for distances, and to be in every way fitted for the flying for which experience had already demonstrated his fitness. The only doubt in my mind lay in the fact that he had only one useful eye, and consequently no "spare part" in the event of an accident to the one good eye, The regulations would class him as unfit because lacking in binocular vision—not because lacking in a spare part.

Now when a person with binocular vision has one eye occluded, his spatial judgements, at any rate for near objects, are interfered with. This is not the case with the possessor of a perfectly alternating strabismus who is accustomed to using either eye with equal facility. Can one avoid the conclusion that the unattainable ideal in an aviator would be to have a perfectly alternating divergent strabismus, thus giving a wider field of view with a perfect spare part?

It is a question of a different sort when we come to the requirements of stereoscopic vision at very close range, such as ophthalmic surgery. At this range the accommodative effort should help largely—perhaps as much as the convergent effort—in forming a judgement. Eminent surgeons, as far as I know, are of the unanimous opinion that binocular vision is necessary for an ophthalmic surgeon. It would be interesting to learn whether this opinion is the result of experience with students and others who have for long been accustomed to monocular vision, and whether they consistently compare unfavourably with those possessing binocular vision, and also whether other causes of clumsiness than the lack of binocular vision had been excluded. It would, of course, be necessary to exclude those who have binocular vision at ordinary ranges, but weak convergence and fusion for near objects. Mr. Bishop Harman, in stating his experience with students, does

not mention whether he had investigated the matter carefully or whether it was merely a general impression derived from his large experience.—I am, etc.,

Brisbane, March 14th. E. O. MARKS.

INSULIN AND DIABETES.

SIR,—In a letter which appeared in the BRITISH MEDICAL JOURNAL of November 18th, 1922 (p. 997), I ventured to predict that the optimistic forecasts then being circulated in the press as to the curative properties of insulin in diabetes would not be fulfilled, and that its true sphere of usefulness was likely to be limited. I have since had the opportunity of putting the treatment to a practical test in a number of cases of various types with insulin prepared in my own laboratory, and the results obtained have tended to confirm the conclusions I arrived at on theoretical grounds. From the articles which appeared in your issue of April 28th it would seem that the experience of other English workers has been similar to mine, for, although it is evident that insulin is capable of reducing the sugar content of the blood in all forms of hyperglycaemia, it is not a "cure" for diabetes in the popular sense of the term—that the patient is able to resume an unrestricted diet after a course of treatment. In the large majority of cases the beneficial effects of insulin are only temporary, ceasing when the injections are discontinued; in a small proportion a permanent improvement in metabolism appears to result, but in my experience these are cases in which the hyperglycaemia and glycosuria are dependent entirely, or almost entirely, upon a functional deficiency of the internal secretion of the pancreas.

As a means for tiding diabetics over crises which are frequently uncontrollable by other methods of treatment, or for ensuring a maintenance diet in severe cases where the power to metabolize carbohydrate is permanently lost, insulin is invaluable, but for the average patient treatment with insulin under present conditions is a will-o'-the-wisp, reliance upon which usually ends in disappointment.

I am interested to see that the observations carried out by Drs. Kellaway and Hughes have led them to the conclusion that insulin improves metabolism by a transformation of carbohydrate into some other complex, with economy of oxygen and liberation of excess of carbon dioxide, for my own experiments, conducted along entirely different lines, have suggested that when insulin is injected the diminished sugar content of the blood which results is associated with an increase in the hydrolysable carbohydrate and deposition of glycogen in the tissues.

It is suggested by Dr. Leyton in his paper that a differential diagnosis between pancreatic and hepatic disease may be made by estimating the sugar in the blood after an injection of insulin, a fall in the sugar indicating a pancreatic origin for the hyperglycaemia, while no distinct change will point to the liver being at fault. Seeing that insulin reduces the sugar content of the blood even in normal animals in proportion to the dose, it would be interesting to have a full account of a case in which "no distinct change" was produced in the blood sugar by a full injection, and the reasons for concluding that the hyperglycaemia was of hepatic origin.

It is unfortunate, in my opinion, that the Medical Research Council have seen fit to adopt a unit of measurement for insulin differing from that originally described by its inventors, as it will lead to endless confusion and call for very careful distinction between doses given on the English and Toronto bases.—I am, etc.,

London, W., April 30th. P. J. CAMMIDGE.

TREATMENT OF PUERPERAL INFECTIONS.

SIR,—Dr. Dudley W. Boswell takes issue with me on my views regarding the above. He finds that I have departed from the teaching which he and I received in Edinburgh from Professor A. R. Simpson. Than my old chief there was no more up-to-date teacher of midwifery. But twenty years ago knowledge of infective processes was not so advanced as it is to-day, and I am sure that Simpson would have been the last to claim that his teaching on any subject was to be the final word for all time.

The case which Dr. Boswell quotes, where death followed removal of a putrid piece of placenta during the febrile period, absolutely supports my contention. According to his chart the patient suffered from sapraemia until the intra-uterine interference was carried out; after that from septicaemia and pyaemia, and finally died.

May I quote a similar case coming within my knowledge? Some seven years ago a patient was admitted to my ward with a high temperature, fetid vaginal discharge, and obviously very ill. She had had a premature labour seven days before. The cervix was patulous. Blood cultures were taken daily for the next six days and were negative. On the seventh day after admission I was tempted to explore the interior of the uterus with my finger and remove some débris. The temperature, as in Dr. Boswell's case, fell and remained normal for about twelve hours and then rose higher than before. Blood culture, taken twenty-four hours after the interference, was positive for streptococcus, and blood infection persisted till the time of her death four days later.

Dr. Boswell does not mention that he took blood cultures in his case, but evidently, from the way in which his chart is worded, he believes that after his interference a blood infection was present.

It is just such cases as his, and the one which I have quoted, which make me feel so strongly that the interior of the uterus should not be interfered with in the presence of fever.—I am, etc.,

Edinburgh, April 30th. B. P. WATSON.

VENOUS PULSATIONS AND VENOUS TRACINGS.

SIR,—The article by Dr. Harrington Sainsbury on venous pulsations and venous tracings, published in the BRITISH MEDICAL JOURNAL of April 14th, seems to me a valuable contribution to the subject. I am glad that he emphasizes the importance, frequently so little appreciated, of the sphincter action of the auricular fibres at the junction with the great veins when the auricle contracts.

In my thesis for the M.D. Paris in 1896 I wrote:

"Si les veines ne se trouvent pas protégées contre l'action de l'oreillette par une valvule, elles se trouvent cependant protégées par une action sphinctérienne très efficace, et, à mon avis, il n'est pas plus difficile de comprendre comment l'oreillette propulse son contenu dans le ventricule, que de comprendre comment une laitière, lorsqu'elle ferme la main, fait écouler le lait du pis de la vache."

In the BRITISH MEDICAL JOURNAL of April 13th, 1912, in an article on the genesis of the venous pulse, I maintained the same view, and also suggested that the wave *a* was probably an inertia or shock wave, due to the sudden arrest of the venous blood stream by the contracting sphincter. In fact, the contracting sphincter not only arrests the flow, but nips the adjacent veins, and must throw back the contents of the diminished lumen, thus aiding incidentally the formation of the wave *a*.

In a leaden water pipe the sudden closing of a water tap at the end evokes a thud, which gradually swells and finally bursts the tube behind the tap. Screw taps are now generally used to avoid this. Were the tube elastic it would make a wave *a* an inertia, or shock, or ballistic wave, and the closed tap would negative any theory of its possible regurgitant origin.

Dr. Sainsbury seems to have difficulty in attributing the wave *a* to the mere advent of blood. He writes:

"Behind the block, and proceeding backwards from it, the blood would gradually accumulate. Can we see here the development of any wave (justly so named) within the veins by the smooth afflux under the low pressures of health?"

I maintain that the veins producing the wave *a* are not dilated merely by receiving a "smooth afflux" of blood. They have to dilate, as I wrote in 1912, "till the dilatation is sufficient to absorb the inertia of the venous column."

One cannot push a candle through a door panel, but it is possible to shoot it through. Motion is as important as material. An incompressible venous column, suddenly arrested at its head, would resist the arrest by dilating the side walls of the containing vessel near the point of arrest. The dilatation would not be by a smooth afflux, but by a light hammer blow near the sphincter, heaping the blood up locally, and sharply dilating the adjacent venous walls; thus starting the wave, which along the jugular is finally recorded as the wave *a*.—I am, etc.,

Mentone, April 21st. D. W. SAMWAYS.

AURICULAR FLUTTER SIMULATING DEATH.

SIR,—In the JOURNAL of April 21st (p. 698) Sir James Mackenzie refers to two very important cases of restoration of the heart beat following upon intracardiac injections of adrenaline, this after cessation of heart beat and respiration for periods of four minutes and three and a half minutes

respectively (*Epitome of Current Medical Literature*, paragraph 302, April 7th, 1923).

In these cases Sir James suspects that "the heart has not really stopped, but has taken on an abnormal rhythm probably of the nature of auricular flutter," and he goes on to suggest that injection into a heart at a standstill could not reach the pacemaker of the heart—that is, the sino-auricular node, which "can only be reached by means of the vessels." He concludes, therefore, "that in these cases there can be little doubt that there was still some circulation."

This point of view assumes that ventricular contractions can only be started via the sino-auricular node, and that the latter can only be reached through its supply vessels; in other words, that the motor apparatus of the heart cannot be influenced by direct stimulation across the endocardial lining membrane. But surely these assumptions are in direct conflict with physiological experiment, as in the case of the isolated frog heart beating in a Roy apparatus, with the ligature, securing the ventricle to the perfusion cannula, placed in the auriculo-ventricular sulcus. By this means the ventricle is not only completely cut off from the auricles and the sinus, but in addition none of the blood circulating through the ventricle has access to auricle or sinus; yet this isolated ventricle responds readily to the influence of drugs introduced into the artificial circulation, and this action can only be *directly across the endocardium*. Without doubt this membrane is very much more delicate in the frog than the mammal, and it may be incomplete; but have we not yet to learn what the susceptibility of the inner surface of the mammalian heart is, especially to powerful agents, such as ammonia, when introduced into the heart, via the veins, in appreciable concentration, as in Halford's treatment of snake bite? It may be that adrenaline has strong penetrating powers (this is mere surmise), but the experiment clearly establishes the fact that the response of the ventricle of the frog heart to stimulation may be a direct one from within, and that it may be wholly independent of the pacemaker. On *a priori* grounds, then, why not the mammalian ventricle also?

In these remarks no account has been taken of the quickness of the response to the adrenaline in the two cases quoted, in one of which the first heart beat followed the injection in seven and a half seconds. Is it conceivable that a circulation showing no signs whatever of cardiac action could convey the adrenaline to the supplying vessels of the node in seven and a half seconds?

The possibility of direct intracardiac stimulation is of such vital importance that we dare not let theoretical considerations outweigh the practical experience of these and other records of intracardiac injection.—I am, etc.,

Wimpole Street, April 25th. HARRINGTON SAINSBURY.

THE NATURE OF ARTERIO-SCLEROSIS.

SIR,—My infrequent visits home and the difficulty of getting at works of reference must be my excuse for this letter.

I read in a French periodical[1] a paper by Tardet on how to lower arterial tension, and he quotes the work of Chauffard and his collaborators on the subject of "l'hypercholestérinémie." When the Goulstonian lectures on the nature of arterio-sclerosis by Dr. Geoffrey Evans were published in your columns, I looked forward to finding mention or confirmation of this theory of excess of cholesterin in the blood. Chauffard is quoted as stating that "the lesion in atheroma of the aorta is very rich in cholesterin, and further that there can exist a condition of hypercholesterin in the blood without precipitation, and that it is probable that this state is only transitory. Sooner or later, according to circumstances, local lesions are caused in bile ducts, arteries, retina, or skin." Elsewhere they speak of "tophus cholestériniques" which form in the tissues, analogous in mechanism to the formation of gouty tophi.

Chauffard, he says, has proved that wherever cholesterin is deposited it is surrounded with fatty lipoids lacking in phosphates, and that, on the contrary, where cholesterin exists in solution—for example, in the brain—it is thanks to the presence of large quantities of phosphates. He proposes, therefore, to combat atheroma, arterio-sclerosis, etc., by giving to the blood a sufficient quantity of phosphates to hold the cholesterin in solution and prevent its deposit in the tissues.

[1] *Revue Moderne de Médecine et de Chirurgie*, October, 1921.

Lemoine and Gerard have a paper in the same periodical entitled "The defence of the organism by the lipoids," and contend that when, as a result of infection, the lipoids rich in cholesterin invade the blood to neutralize the infection the excess is deposited, causing arterio-sclerosis. On studying the Goulstonian lectures I find no mention or reference to this work or theory, and would like to know if Chauffard's work has been corroborated or disproved in England. Perhaps some of your readers could give me a reference to his papers or works.

Dr. Evans begins his paper by saying that arterio-sclerosis is a process of disease with an onset that as yet escapes clinical recognition, and a course in which arrest or recovery is commoner than death. If Chauffard's work is sound, would it not be possible to devise tests for the amount of cholesterin and phosphates in the blood and to act accordingly?

Dr. Evans has produced a paper full of instruction about the vessel wall, but perhaps we should not lose sight of the contents of the vessel.—I am, etc.,

H. E. S. STIVEN, M.D.,
P.M.O., Government Hospital, Port Said.

HOSPITAL POLICY.

Staff Funds.

SIR,—Two points become apparent on reading the Annual Report of Council on the question of staff funds. The first is the complete lack of interest in the matter shown by the Divisions; only 58 replies were received to the special memorandum issued last November—not a very enthusiastic response from some 180 Divisions. Of these, 44 only signified their approval of the Council's proposed amendment to the Leicester resolution (paragraph 33 infra). It is surely apparent that this part of the hospital policy, at any rate, leaves the Divisions "cold," and it is a fair presumption that the carrying out of the proposed new paragraph 33, if it is passed, will leave them "colder" still.

The second point is the ingenious misinterpretation by the Council of the instruction contained in Minute 327 of the Annual Representative Meeting, 1922:

> "That when the report on hospital policy comes before the Divisions for further consideration, statistics should be supplied showing the number of hospitals in which a staff fund has been established."

In spite of the fact that this staff fund problem has been under discussion for some two years and a half the Council still considers it inopportune to try and find out and inform the Divisions whether anything has been done about it. The above instruction is quite free from ambiguity, and the resolution was moved and carried with the express intention of obtaining this information *before* and not *after* the completion of the hospital policy.

It really appears that the Council is determined to get a complete policy established, without any regard to the prospects of its being actively supported by the Divisions.

I would maintain once more that unless further evidence to the contrary is produced paragraph 32 meets all requirements at the moment, and that Divisions would be well advised to instruct their representative to vote for the deletion of paragraph 33.

Paragraph 32.—When the Board of Management of a Voluntary Hospital enters into a financial arrangement with a Public Authority, an Employer of Labour, Approved Society, Insurance Company, or under a Contributory Scheme or otherwise for the reception of patients, such arrangement should be taken to cover the cost of maintenance and medical treatment, and a percentage of all such receipts should be passed into a fund which is at the disposal of the honorary medical staff of that hospital.

Paragraph 33.—Income derived from gratuitous contributions, existing assets, endowment funds, and the like, are not liable to assessment for Medical Staff Fund purposes, but all payments made for hospital benefit [other than payments made by private patients referred to in Sections IX (a) and IX (b)] are in fact payments towards all the services of the hospital whether medical or ancillary, and therefore a percentage of such payments should be passed into a fund which is at the disposal of the Honorary Medical Staff of that hospital. Small payments of individual patients not recoverable from third parties may be assessed in a nominal percentage only as a token recognition of the policy enunciated.

—I am, etc.,

Bury St. Edmund's, April 30th. BERNARD E. A. BATT.

REGISTRATION OF NURSES.

SIR,—You published in your issue of April 28th (p. 740) a set of rules for the registration of nurses, proposed by the medical members of Parliament.

The effect of them will be that everyone who has been nursing the sick for three years before November 31st, 1919, will be entitled to registration. The proposed rules take no account of training whatever. It is suggested that the Council should examine such nurses, but the examination would necessarily be of so narrow a scope that it would be wholly unsatisfactory to the examining body, and if it was of a searching character in the small area open to it would certainly be considered unfair by the candidates.

Medical men have co-operated heartily with nurses in raising the standard of nursing for the benefit both of the public and of nurses themselves. It seems to me a pity that medical men should now propose that all the efforts of the last twenty years should be made of no account.

The Council has itself proposed that nurses in practice before 1900 should be admitted on evidence of competence, and it might be wise to extend that limit, but I cannot look upon the present proposal as other than retrograde. I may add that I should think it highly doubtful whether any trained nurses would have registered at all if these proposals had been made a part of the Act.

Since, however, I am expressing merely my own opinion, I should be glad if other medical men would state their views in your columns.—I am, etc.,

W. P. HERRINGHAM,
Chairman of the General Nursing Council for England and Wales.

12, York Gate, Regent's Park, London, N.W.1, May 2nd.

COLONIAL MEDICAL SERVICES.

SIR,—The important leading articles in your recent issues on the proposed disastrous economies in the Indian and Kenya Colony Medical Services reveal an increasingly serious state of affairs in the health policy of the Empire. These are particularly flagrant instances of recent occurrence, but it is unquestionable that a review of the health conditions of the Colonies would show (with certain bright exceptions) starved services cut off from contact with the main stream of medical progress, populations riddled by preventable disease, and an amazing general neglect of tropical hygiene.

Of the main factors which prevent progress perhaps the two most important are: First, the lack of a director-general or indeed of any responsible administrative medical officer at the Colonial Office. With a medical service working under lay administration, and no central administrative medical officer in authority to deal with medical problems, it is small wonder that the position is melancholy.

Secondly, the very general ignorance of health questions among the influential classes of many colonial communities, especially the business sections. Hygiene has formed no part of their education, and of the economic possibilities of public health they know little; to the majority it seems an extravagant fad which hard-headed men will cut down to a minimum. In one colony with a splendid climate and a death rate of over 40 a prominent citizen asked me once in surprise, "Why should I pay to keep other people well?" In another colony with a death rate which is persistently higher than the birth rate and labour is a vital problem, a leading official told me gravely that he would "much rather die of malaria than live in a mosquito-proof house."

It has occurred to me, and no doubt to many others infinitely better qualified to speak than myself, that the British Empire Exhibition of 1924 will present a unique opportunity for an educational campaign. I should be glad to know whether arrangements are in hand adequate to the great opportunity and the great need. A well organized "Medical and Hygiene" Section, with a series of good lectures and conferences, might easily be one of the most widely attractive in the exhibition. There are plenty of experts, practical men cognizant of difficulties as well as deficiencies, who are competent to carry through such a scheme, and no doubt willing to add to their past record of public service. Are they being given a chance?—I am, etc.,

London, W.C., April 25th. LETITIA FAIRFIELD, M.D.

PHYSIOLOGY AND PSYCHOLOGY.

SIR,—In your issue of April 14th Dr. Berry was good enough to refer to a letter of mine published by you on December 30th, 1922. I mentioned there the presidential address of Sir Charles Sherrington, P.R.S., to the British Association, in which he discussed the action of mind upon bodily mechanism. My allusion to this address was in general terms, and in order to avoid any possible misconception I will, with your permission, quote certain passages from the address which will make the matter clear. I desire to do so as I feel that Sir Charles Sherrington has indicated with high authority and with remarkable lucidity the relations of physiology and psychology which it is of great importance that all should recognize. He said:

"I do not want, and do not need, to stress our inability at present to deal with mental actions in terms of nervous actions."

Then, after a most interesting account of the resemblances between the "mental" and the "nervous," he said:

"Yet all this similarity does but render more succinct the old enigma as to the nexus between nervous impulse and mental event. . . . The nexus between the two sets of events is strict. But for comprehension of its nature we still require, it seems, comprehension of the unsolved mystery of the how of life itself. A shadowy bridge between them may lie perhaps in the reflection that for the observer himself the physical phenomena he observes are in the last resort psychical."

One more quotation may be given:

"It is to the psychologist that we must turn to learn in full the contribution made to the integration of the animal individual by mind."

These are generous words from a distinguished physiologist, and it would be well if the whole address could be widely studied. A summary of it appeared in the BRITISH MEDICAL JOURNAL for September 9th, 1922, but every line of it is of interest. Dr. Berry, I am sure, would rejoice in this presentation of the case from the side of physiology, and I doubt not that he would follow the lead of the President of the Royal Society in according to the students of psychology their rightful place in dealing with the problems of life. This is all we ask. We were all of us physiologists before we became psychologists, and it is of vital importance that these two branches of research should work in the closest co-operation.

Dr. Berry may be sure, if I may be allowed to say so, that readers of the BRITISH MEDICAL JOURNAL highly value the breezes which come from the "outposts of empire." If some criticisms of his letter have erred on the side of frankness he will perhaps regard it as evidence of the brotherly spirit —I am, etc.,

London, E.C., April 14th. CHARLES F. HARFORD.

A SIMPLE DIET TABLE.

SIR,—I should be obliged if you would allow me to correct an error in a note of mine, entitled "A Simple Diet Table," in your issue of April 21st (p. 679). The item "12 Kalari biscuits" should be in the one ounce protein section, not in the one ounce carbohydrate content section, as Messrs. Callard and Co. guarantee that they contain less than 3 per cent. of carbohydrates.—I am, etc.,

Liverpool, April 25th. H. S. PEMBERTON.

ACCORDING to the medical report for 1920 to 1922, the work of the Tainan Hospital, English Presbyterian Mission, Formosa, is increasing greatly year by year, particularly in abdominal surgery and gynaecology. In the first six years of the hospital's existence 104 abdominal operations were performed, and in the past year 125; during the first six years there were 72 obstetrical and gynaecological operations, and during the past year 104. These figures indicate a growing readiness among the inhabitants to submit to serious surgical procedures. In Formosa there is a strange absence of certain diseases common in the West; appendicitis and cancer of the stomach are very rare, though gastric and duodenal ulcers are not uncommon. On the other hand, the most common abdominal emergency in Formosa appears to be chronic intussusception. From 1920 to 1922, 3,964 surgical operations were carried out, 2,156 of them under general anaesthesia; there were 4,643 male in-patients, and 1,933 female in-patients; and the total attendances of out-patients amounted to 77,311. There are 150 beds in the hospital, with a staff of two European medical men, two trained nurses, two Formosan assistants, two trained and eight other Formosan nurses.

Obituary.

SIR SHIRLEY MURPHY, K.B.E., F.R.C.S.,

Formerly M.O.H. London.

We regret to announce the death of Sir Shirley Forster Murphy on April 27th, at the age of 74. He had been in failing health for some time, but the immediate cause of death was influenza and bronchitis.

Shirley Forster Murphy was born in 1848, educated at University College School and Guy's Hospital. After qualifying M.R.C.S. in 1870 he set about acquiring experience in various directions with a view to fitting himself for what he seems to have regarded from the first as his life's work. He was for some years resident medical officer at the London Fever Hospital and also worked for a time as an officer of the Metropolitan Asylums Board, thus acquiring clinical experience of infectious diseases which served him in good stead. He became Assistant Director at the Animal Vaccine Station and was always specially interested in any question relating to small-pox or vaccination. He was for some years Medical Officer of Health in St. Pancras, there gaining knowledge of housing problems and of sanitary conditions generally, of which he made such good use in later years.

For a time he acted as the first honorary Medical Officer of the Mansion House Council on the Dwellings of the Poor, and already in these early years he was asked to undertake special inquiries, for example, into the sanitary condition of Southend and into outbreaks of infectious disease by the Local Government Board, and he also took part in a housing inquiry for the Home Office. He was particularly interested from the outset in various branches of work in connexion with public health outside his ordinary official activities; for instance, he formed a close friendship with Mr. C. S. Loch, the secretary of the Charity Organization Society, and was especially familiar with the work of Miss Octavia Hill and with that of the Rev. Samuel Barnett at Whitechapel. He was, moreover, appointed lecturer on Hygiene and Public Health at St. Mary's Hospital.

Throughout his life he was intimately associated with the Society of Medical Officers of Health, of which he was one of the secretaries and in 1891-2 and again in 1904-5 the president. In his first presidential address to the Society he said the beneficial results which were then accruing, from the activities of medical officers of health, were such as to convince people that this was work which should be assisted and not hampered. It is interesting, in the light of this observation, to compare certain average rates for the first three and the last three years of the 22 years during which the author of the statement was County Medical Officer. The death rate from all causes declined from 20.1 to 14.6; the death rate from the principal epidemic diseases fell from 5.57 to 2.98; and the infant mortality from 152 to 113 per 1,000 births. It was always his aim to secure the co-operation of his colleagues the medical officers of health. As he said, in 1905, soon after he was for the second time made president of the Society, speaking of his London colleagues, "My association with them has always been a pleasure. I have received their assistance, their kindly criticisms, and at all times their good will." He often spoke, too, of the cordial sympathy and support he received from the medical department of the Local Government Board, from the Chief Inspector of the Home Office and from the Superintendent of Statistics at Somerset House.

Soon after he qualified, he became a member of the Epidemiological Society and from 1877 to 1889 acted as one of its secretaries. In his arduous duties in connexion with this Society and the Society of Medical Officers of Health, he always relied largely upon the assistance of Lady Murphy. One of his earliest papers for the Epidemiological Society was on "Sanitary administration of dairy farms," in 1888. When he became president in 1894 he delivered an address on the Study of Epidemiology, in which he first made reference to the remarkable "August depression" exhibited by the notifications of scarlet fever and diphtheria in London. The "notch" in the seasonal curve of these two diseases was specially observable when consideration was limited to the school ages, and this phenomenon led to special study of the question as to how far "school influence" was operative in promoting the spread of these diseases. In the session 1897-8 he read a paper on "Seasonal variations in age distribution and fatality," and followed this up in the session 1899-1900 by another paper on "Seasonal variations in the age distribution of deaths in certain diseases." One of his latest contributions was a paper on the "Variations in the age-incidence of mortality" read in March, 1897.

He served at one time or another on several departmental committees and, either as witness or member, in connexion with Royal Commissions. He managed to learn a great deal about the behaviour of epidemic diseases in all parts of the world, and, as his friend Sir Arthur Whitelegge once observed, it was always a wonder to those who knew him how he contrived to keep himself abreast of all the latest work at home and abroad. Sir Arthur Whitelegge added that he suspected that Lady Murphy acted as a worthy helpmate in this, as in all other respects. His name was well known to epidemiologists and public health workers all over the world and he was always at the disposal of any foreign visitors and ever ready to give them every help in his power.

He was elected a Fellow of the Royal College of Surgeons of England in 1909, and he became vice-president of the Royal Sanitary Institute and of the Royal Statistical Society; he was awarded the Jenner medal by the Royal Society of Medicine, and the Bisset Hawkins medal for distinguished service to the public health by the Royal College of Physicians. In association with Sir Thomas Stevenson he edited Stevenson and Murphy's *Treatise on Hygiene*.

His wide outlook and early training and experience in so many branches of public health and epidemiology were no doubt largely responsible for the fact that in 1889 the first London County Council appointed him as its Medical Officer of Health. In the early days of the Council the question of the clearance of insanitary areas, which had been brought prominently before the public at the time of the Housing Commission, of which the late King Edward-VII was a member, occupied a great deal of his time. He obtained detailed personal knowledge of the insanitary areas in the County of London, and devoted a vast amount of work to the study of these areas in co-operation with the local medical officers of health with a view to effecting clearances; he gave evidence at the numerous housing inquiries which were held during the succeeding years by the Home Office or the Local Government Board. The question of London water supply was the subject of a Royal Commission of Inquiry, in the early nineties, and the London County Council, on Sir Shirley Murphy's advice, had surveys made of the rivers Thames and Lee and their tributaries, with a view to evidence as to pollution being placed before the Commission. He was always impressed with the fact that the death rate from water-borne diseases in London (which was supplied with river water) did not compare unfavourably with the corresponding death rate in Glasgow (which obtained a pure lake supply brought from a long distance); and it was partly due to his general attitude on the question that the policy ultimately adopted was that of improving the existing river supplies and not embarking upon the ambitious project of going to Wales. He was always, however, concerned to see that steps were taken to obviate danger from flood water, and that full consideration was given to perfecting the arrangements for storage and filtration.

He had to do with framing by-laws relating to drainage and refuse removal, to offensive trades, and to common and seamen's lodging houses in London. The operation of by-laws relating to house and trade refuse brought about great amelioration as regards fly prevalence. It has often been the subject of comment by visitors from American and Continental cities to London that there should be such freedom here from the mischiefs caused by the retention within the curtilage of houses or within the town of accumulations of decomposing materials.

Prevalences of infectious diseases necessarily occupied a large share of attention. The outbreak of cholera in

Hamburg in 1892 caused much apprehension in this country, and, as a matter of fact, four cases of undoubted Asiatic cholera actually occurred in London in the summer of the following year, but the disease did not spread. The small-pox of 1893 and 1901-2—more particularly the latter—smouldered to some extent among common lodging-house inmates, and this led to a scheme, for the early diagnosis of small-pox cases generally, being elaborated by Shirley Murphy, and ultimately to the appointment of a special medical expert for this purpose. The particulars with regard to all doubtful cases were circulated by Sir Shirley to his colleagues in the different parts of London and in immediately surrounding areas. A number of milk outbreaks of scarlet fever occurred during the years when Sir Shirley Murphy held office, and prompt stoppage of the infected supply of milk was always secured by him. In 1894 he prepared a memorandum on diphtheria prevalence in London which stimulated further research into this question.

The nature of some of the various special reports included in his annual reports may be illustrated by reference to a few of them. The First London Life Table was prepared on the basis of the Census figures of 1891-1900, and published in 1901. Numerous reports on the sanitary conditions of various London districts were made year by year. In 1894 he reported on Enteric Fever in relation to water supply, and on an outbreak of Scarlet Fever in Blackheath, also on the Disposal of House Refuse and on Disinfection; in 1895 on London By-laws generally; in 1896 on prevalences of Diphtheria; in 1897 on By-laws as to Houses let in Lodgings; in 1898 on the Preparation and Sale of Food, on Provision of Public Slaughterhouses, and on Mortality in relation to overcrowding; in 1901 on Experiments on Disinfection; in 1902 on Accommodation for Women in Common Lodging Houses; in 1904 on Watercress; in 1905 on the conduct of the businesses of fried fish sellers, fish curers, and marine store dealers; in 1906 on Inspection of Food by riparian authorities; in 1907 on Cerebro-spinal fever; in this and the two following years, on nuisance from flies and vermin; and in 1909 on an outbreak of Scarlet Fever and on Pulmonary Tuberculosis.

From 1904 onwards night censuses of homeless persons in London were taken every February; they were found of great use by the Local Government Board, and largely contributed to provision being made to prevent accumulation of poor persons on the Thames Embankment in the winter months.

In 1904 he was knighted. Soon after his retirement from the office of Medical Officer of Health for the County of London the war broke out, and he at once volunteered for military service. He was placed in charge of the sanitary service of the London area, and entered upon his work as Lieutenant-Colonel R.A.M.C.(T.F.) at the Horse Guards. In 1919 he was created K.B.E. in recognition of these services.

In recent years he served on the London Insurance Committee, and acted as representative of the Government at congresses in America, and as Deputy Chairman of the Trade Board for the Fur Trade in Great Britain. In 1920-21 he was Master of the Society of Apothecaries, with which he had long been associated. In 1921 he was nominated by the Ministry of Health as a manager of the Metropolitan Asylums Board.

He married, in 1880, Ellen, daughter of the late Henry S. King, and sister of Sir Henry Seymour King, K.C.I.E. The deepest sympathy will be felt for Lady Murphy and her two daughters.

W. H. HAMER.

Sir Shirley Murphy was long a member of the British Medical Association; he was secretary of the Section of Public Medicine of the Annual Meeting in Belfast in 1884, vice-president of the Section at the meeting at Leeds in 1889, and president of the Section of State Medicine in 1901, when the Association held its Annual Meeting at Cheltenham.

A largely attended memorial service was held at the Church of St. Martin-in-the-Fields on the morning of Tuesday, May 1st.

A. E. BROSTER, L.R.C.P., M.R.C.S.

WE regret to record the death at Exmouth of Dr. A. E. Broster, who practised for many years in Wirksworth. Arthur Erdswick Broster was born in 1854 and received his medical education at University College Hospital Medical School. He was house-physician to University College Hospital and afterwards resident medical officer to the National Hospital for the Paralysed and Epileptic. He took the diplomas of L.R.C.P.Edin. and M.R.C.S.Eng. in 1877, and in that year served as surgeon to the Red Cross in the Russo-Turkish war. Soon afterwards he settled in Wirksworth, Derbyshire, where he was greatly esteemed both for his character and his medical attainments. He was medical officer of health for the town for over thirty years and was a J.P. for the county of Derbyshire.

We are indebted to Sir THOMAS BARLOW for the following short tribute: I knew A. E. Broster well, as a student, a resident, and as a fellow practitioner. He was a good all-round doctor—good from start to finish. I saw many of his patients from the Derbyshire dales with him. His statements about his cases were models—terse, accurate, complete, with no essential omitted. He was modest, but he knew his job, was resourceful, and he could hold his own. It was a privilege to meet him, to hear his North Country speech and note his quiet humour. He was very humane and the staunch friend of every one of his patients. May there never be a lack of doctors like him on the English countryside!

The death of Dr. REES MORGAN of Newport (Mon.) took place somewhat suddenly on April 11th, although he had been in ill health for two years. He was born in 1855 at Llandovery, Carmarthenshire, and was educated at Llandovery College, and afterwards at Edinburgh and Glasgow. He obtained the L.R.C.P. and S.Edin. in 1884. His first three years of practice were spent at Treherbert, whence he removed in 1887 to Llandilo. There he carried on a very successful practice for ten years, but was obliged to relinquish it owing to a bad breakdown in health. A trip to South Africa and a short residence there completely restored him, and on his return he resided for a time at Bexhill. In 1899 he went to Newport, where, by his painstaking and self-denying work, he gained the confidence of a large clientèle, which he retained until his retirement two years ago. During the war Dr. Morgan's labours were greatly increased owing to the depletion of the medical profession and undoubtedly his unremitting toil shortened his term of life. He leaves a widow, three daughters and two sons—one of whom, Dr. Glyn Morgan, succeeds him in the practice. He was a member of the British Medical Association and of the Newport Medical Society and generally attended local meetings of the profession, but took no part in public work. A COLLEAGUE (S. H.) writes: Dr. Morgan was a man of very quiet and unassuming disposition, simple in his tastes and habits; his ready reading of character and understanding of human nature, together with a broad sympathy, made him popular with a large circle of friends. He performed many unostentatious acts of charity to the needy. Among his professional brethren he was highly respected; he was straightforward and honest and was never known to do a mean or unkind act. He leaves behind him a record of work well done and a sweet memory in the minds of his numerous patients and friends.

Dr. GEORGE FRANCIS RHODES of Huddersfield died on April 15th, aged 64. He received his medical education at the University of Edinburgh and the London Hospital and graduated M.B., C.M.Edin in 1887. He had served as ophthalmic assistant at Middlesex Hospital, clinical assistant at Royal London Ophthalmic Hospital and senior house-surgeon to the Huddersfield Infirmary. In 1893 he succeeded his father in the appointment of medical officer of the North District and public vaccinator of the Central District of the Huddersfield Union, and only recently resigned owing to ill health. Dr. Rhodes was a member of the Huddersfield Division of the British Medical

Association. He was for a number of years sidesman at St. Paul's Church and one of the managers of St. Paul's Day Schools. The interment, which was preceded by a service at St. Paul's Church, took place at Edgerton Cemetery on April 18th.

Dr. JOHN KILPATRICK STEWART died suddenly at Randalstown, co. Antrim, on April 15th, aged 30. The son of the late Mr. John Smith Stewart of Grange, he was educated at Ballymena College and Queen's University, Belfast, and graduated M.B., B.Ch., B.A.O., with honours, in 1915. Shortly after graduation he was granted a temporary commission in the R.A.M.C. and while serving as medical officer to a battalion of the Durham Light Infantry in France was severely wounded. On demobilization he was appointed medical officer of the Randalstown dispensary district and in that office won the esteem of all with whom he came in contact. Dr. Stewart was a member of the Ballymoney, North Antrim and South Derry Division of the British Medical Association. He is survived by his widow and three young children. His younger brother is Dr. Hall Stewart of Ballymena. The funeral took place on April 17th and was attended by many medical colleagues.

The Services.

Inspector-General of Hospitals and Fleets Walter Reid, M.D., R.N., has been awarded the Greenwich Hospital pension of £100 a year in the vacancy created by the death of Inspector-General William H. Lloyd, M.D., R.N., on April 2nd.

TERRITORIAL DECORATION.

THE Territorial Decoration has been conferred upon the following officers:

R.A.M.C., T.A.—Lieut.-Colonel J. Miller, D.S.O., M.C., Major W. Y. Martin (ret.), Major J. A. H. Aitken, O.B.E. (ret.), Major J. R. Menzies.

R.A.M.C., T.A.R.—Lieut.-Colonel S. G. Barling, C.M.G.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

AT the congregation held on April 27th a congratulatory address to St. Bartholomew's Hospital, written by the Public Orator, was ordered to be engrossed and sealed and presented by the representative of the University at the celebration next month of the octocentenary of the foundation of St. Bartholomew's Hospital and Priory. Approval was also given to an address to the Universities of Paris and Strasbourg, to be presented by the representative of the University at the Pasteur centenary celebrations this month.

The following medical degrees were conferred:

M.D.—E. St. G. S. Goodwin, *L. A. P. Anderson, L. S. Gathergood.
M.B., B.CH.—F. H. Robbins.

*Admitted by proxy.

VICTORIA UNIVERSITY, MANCHESTER.

THE following resignations have been accepted by the Council:—Professor A. V. Hill, Sc.D., F.R.S., from the Brackenbury Chair of Physiology, on his appointment to the Jodrell Chair of Physiology, in the University of London. Dr. J. G. Clegg, from the Lectureship in Ophthalmology.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.

AN ordinary Comitia of the Royal College of Physicians of London was held on Thursday, April 26th, at 5 p.m., the President, Sir Humphry Rolleston, being in the chair.

Membership.

The following candidates, having passed the recognized examination, were admitted as Members:

Charles Wm. Buckley, M.D.Lond. (Buxton), Robert Coope, M.D.Liverpool (Liverpool), Leslie Cunningham, M.B.Camb. (Liverpool), Stanley Edward Denyer, M.D.Camb. (Hull), John Douglas Hope Freshwater, M.D.Camb. (London), Sylvia Kema Hickson, M.B.Manc. (Manchester), Reginald Hilton, M.B.Camb. (London), Peter Knight McCowan, M.D.Edin. (Mental Hospital, Coulsdon, Surrey), Abdel Razik, L.R.C.P. (London), Maurice Elgie Shaw, M.B.Oxf. (London), John Stokes, M.D.Durham (Sheffield), Gavin Burce White, M.B.Syd. (London), Victor Richmond Woodhill, M.B.Syd., Fredk. Hugh Young, M.B.Camb. (London).

Applications, attributed to the recent alteration of the by-laws relating to members, for the restoration of the Membership by Drs. E. A. Gates, Reginald Pratt, A. Gregson Williams, William McCallin, and M. K. Robertson were acceded to.

Licence.

Licences to practise Physic were granted to the following 159 candidates, who had conformed to the by-laws and regulations and passed the necessary examinations.

C. Abbu, J. W. Alden, F. G. Allen, D. D. Anderson, §Constance E. Appleton, G. B. M. Apsey, E. W. Arndt, N. Asherson, §Lucy T. Badcock, W. H. Bailie, D. N. Balter, V. H. Barker, M. K. Barnett, §Jessie H. Baxter, A. H. Bennett, H. W. Bland, B. Bourke, C. G. Bowen, J. F. Brailsford, O. Brenner, T. F. Briggs, B. Broadbent, F. Brockington, W. A. Brown, §Dorothy E. B. Buckmaster, §Helen Bumstead, J. T. Burrell, §Viola C. Cameron, J. M. Clarke, §Olive G. Clouston, E. Cohen, R. S. Coldrey, P. Connan, W. F. Cooper, §Florence E. Cowlin, D. W. Cromble, S. J. Davies, M. Denman, V. P. de Zoysa, H. T. Edmunds, D. G. M. Edwards, R. S. Ellis, §Lucy M. Elson, §Gwladys Evans, M. W. H. Evans, V. F. Farr, §Emmie D. Fenwick, §Margaret Findlay, A. L. Finiefs, G. H. Fitzgerald, §Annie Foner, K. V. Francis, §Margery Freeborough, F. W. Furniss, P. C. C. Garnham, §Una C. Garvin, Lena B. Gayer, L. Ghabrial, §Marjory A. Godfrey, S. J. Golden, §Louisa P. Gordon, §Marion Greaves, J. R. Hamerton, L. W. Hamp, N. G. Harris, J. S. Hawes, §Katherine M. Hick, R. A. Highmoor, D. B. Hitchings, J. Holroyd, W. D. Hoskins, D. H. Hubbs, §Audrey M. Hughes, L. D. A. Hussey, R. Jackson, T. James, M. Jayakar, A. Jephcott, F. Lawrence, §Ruth A. M. Leak, F. H. Leekam, P. Leftwich, E. Linfoot, A. R. Lister, N. L. Lloyd, L. P. Lockhart, Marian Lones, C. A. Lupton, C. R. McClure, §Phyllis C. Mackenzie, §Kate Madders, C. C. W. Maguire, J. Marley, §Edith T. Marshall, §Edith W. W. Marshall, W. H. Marston, L. Mather, §Kathleen F. Matthews, M. Mitman, V. S. Monie, A. J. Morland, N. R. Mucadam, E. B. Murrell, H. W. Needham, F. W. Pare, C. M. Pearce, T. V. Pearce, J. P. Peel, A. F. Percy, J. W. Perkins, J. H. Piddock, L. R. W. Price, §Gertrude E. Pugmire, §Margaret A. Quine, R. P. Rees, §Phyllis M. Rex, M. M. Raid, D. Riding, C. E. Roach-Smith, J. A. W. Roberton, G. T. Robinson, H. N. Rose, §May K. Ruddy, Anis Salama, §Edna M. Sanders, D. H. Sarafian, §Margaret V. Saul, B. E. Schlesinger, A. T. Schofield, G. D. Shaw, A. W. L. Smith, C. N. Smith, N. R. Smith, C. F. V. Smout, E. G. Snaith, J. V. Sparks, A. L. B. Stevens, §Ella M. Stratton, H. H. Sumption, S. S. Suzman, E. J. Targett, E. Thorpe, K. W. Todd, §Olga F. Tregelles, §Gladys M. Tullidge, C. F. Turner, A. S. H. Walford, §Marjory W. Warren, §Constance C. M. Watson, M. Weinbren, L. E. H. Whitby, D. B. Whitlock, M. C. Wilkinson, L. G. Williams, L. A. Willmott, J. G. Wilson, §Lina M. C. Wingfield, J. L. Woodhouse, M. I. Zimmerman.

§ Under the Medical Act, 1876.

Diplomas in Public Health and in Tropical Medicine.

Jointly with the Royal College of Surgeons, Diplomas in Public Health were granted to 20 candidates, and Diplomas in Tropical Medicine and Hygiene to 10 candidates.

D.P.H.—E. B. Allnutt, Ursula P. Blackwell, H. Carpenter, Ursula B. Cox, R. T. Edwards, D. M. Jones, D. G. Karandikar, H. T. Le Vieux, E. K. Macdonald, E. O. Morphy, W. W. Morrison, G. G. Naoleker, H. A. Osborn, A. E. Quine, J. L. Rebello, Eleanor M. Reece, F. A. Robinson, K. K. Shenai, K. Singh, G. Tate,

Diploma in Tropical Medicine and Hygiene.—R. Briercliffe, C. Cook, H. S. de Boer, M. L. Dhawan, C. H. Han, A. G. Harsant, C. de C. Martin, A. C. Rebello, R. H. Simpson, E. Tagoe.

Fellowship.

The following were elected Fellows on the nomination of the Council:

Richard Hingston Fox, M.D.Brussels (London), John Porter Parkinson, M.D.Lond. (London), David Waters Sutherland, C.I.E., M.D.Edin. (Indian Medical Service), Donald George Hall, M.D.Camb. (Brighton), Wilfrid Stephen Fox, M.D.Camb. (London), John Cyril Holdich Leicester, M.D.Lond. (Indian Medical Service), Frank Edward Tylecote, M.D.Manc. (Manchester), John Owen, M.D.Lond. (Liverpool), Leonard Gregory Parsons, M.D.Lond. (Birmingham), John Parkinson, M.D.Lond. (London), Alfred Hope Gosse, M.D.Camb. (London), Philip Henry Manson-Bahr, D.S.O., M.D.Camb. (London).

Nominated by the Council under By-law XLI (b):

Sir Hugh Kerr Anderson, M.D.Camb. (Master of Caius College, Cambridge), Byrom Bramwell, M.D.Edin. (Edinburgh).

A Gift.

An offer was accepted from Mr. H. Wilson Holman of the memorial to the late Dr. William Musgrave, F.R.S., F.R.C.P., formerly in St. Leonard's Church, Exeter, in which city he practised.

Appointments.

Dr. Herbert Morley Fletcher was appointed to represent the College at the centenary celebration of the birth of Pasteur to be held in Paris on May 24th-28th, and in Strasbourg from May 31st-June 1st. Dr. Fawcett was reappointed a representative of the College on the Senate of the University of London.

Resignation of Treasurer.

A letter was received from the Treasurer, Sir Dyce Duckworth, dated March 25th, and addresed to the President, expressing his intention of resigning his office in July next. The resignation was accepted with regret, all the Fellows standing, after eloquent tributes to the Treasurer expressing appreciation of his great services to the College during the 39 years he has held the post had been made by Dr. Sidney Phillips, Dr. Raymond Crawfurd, and the Registrar. Sir Dyce Duckworth was appointed Emeritus Treasurer.

LONDON INTER-COLLEGIATE SCHOLARSHIPS BOARD.

FIFTEEN medical entrance scholarships and exhibitions of an aggregate total value of about £1,530, tenable in the Faculty of Medical Sciences of University College and King's College, and in the medical schools of Westminster Hospital, King's College Hospital, University College Hospital, the London Hospital, and the London (Royal Free Hospital) School of Medicine for Women, will be offered for competition on Tuesday, June 26th, 1923. Full particulars and entry forms may be obtained from the Secretary of the Board, S. C. Ranney, M.A., the Medical School, King's College Hospital, Denmark Hill, S.E.5.

SOCIETY OF APOTHECARIES OF LONDON.

THE following candidates have passed in the subjects indicated:

SURGERY.—R. Caplan, L. A. Daly.
MEDICINE.—W. E. Farnham, B. Hart, L. D. A. Hussey, W. J. Jameson.
FORENSIC MEDICINE.—B. Hart, L. D. A. Hussey, W. J. Jameson, I. Lipman, S. Thompson.
MIDWIFERY.—C. M. John, I. Lipman, M. McW. Lopez, H. Maclachlan, O. Sinanides, S. Thompson, R. A. Walker.

The diploma of the Society has been granted to Messrs. L. A. Daly, L. D. A. Hussey, M. McW. Lopez, and R. A. Walker.

Medical News.

THE dinner of the Medical Society of London to commemorate the one hundred and fiftieth anniversary of its foundation by Lettsom in 1773 will be held at the Hyde Park Hotel on May 15th. Lord Dawson of Penn, President of the Society, will be in the chair, and H.R.H. the Prince of Wales has signified his intention of being present. Arrangements have been made to seat 350 persons, and a large and representative gathering is expected.

As we announced lately, a feature of the celebration of the eight hundredth anniversary of the founding of St. Bartholomew's Hospital will be the revival after nearly one hundred years of the great City Fair of London, Bartholomew Fair. The fair originated in the permission given to Rahere by Henry I to hold a cloth fair to assist the erection and maintenance of the hospital he was building on the site where it now stands in Smithfield. The students of St. Bartholomew's Hospital to-day have selected the Tudor period as being the one which perhaps illustrates Bartholomew Fair at its zenith, and the revels, contests, and sports which characterized the fair at that period will be reproduced this year. The Lord Mayor of London, in conformity with ancient custom, will open the fair, and the old ceremonies connected with this civic event will be reproduced. It is thought that many would like to contribute goods to be sold at this revival of an old scene, and gifts will be welcomed; they should be addressed to the Matron, St. Bartholomew's Hospital, E.C.1, and marked "Bartholomew Fair."

SIR THOMAS BARLOW will preside at the annual meeting of the Royal Medical Benevolent Fund to be held at the Royal College of Physicians, Pall Mall East, S.W.1, on Monday next at 4 p.m. The chairman will be supported by Sir Humphry Rolleston, President of the Royal College of Physicians, Sir Anthony Bowlby, President of the Royal College of Surgeons, and Sir William Hale-White, President of the Royal Society of Medicine. Addresses will be given by the Archbishop of Canterbury and Lord Sumner.

AMONG the honorary degrees which Glasgow University proposes to confer at the graduation ceremony next month is the LL.D. upon Sir Walter Fletcher, M.D., F.R.S., Secretary of the Medical Research Council, and Dr. W. C. Lusk, Professor of Clinical Surgery in New York University.

WE have received a copy of the first number of a new quarterly magazine entitled *Ambulance*, which is intended to be a link between people at home and abroad who are interested in such subjects as first aid, hygiene, and the national health. The first number contains several interesting short articles, including one on the origin of ambulance work, by Sir James Cantlie, and another on the use and abuse of tourniquets, by Dr. W. Salisbury Sharpe. The periodical is well printed and has an effective cover design. It is published at the College of Ambulance, 56, Queen Anne Street, W.1; the annual subscription is 2s. 6d., post free, and single copies cost 6d., post free 8d.

THE next session of the Dental Board of the United Kingdom will be held on Wednesday, May 9th. At the opening of the business at 2 p.m. the Chairman, the Right Hon. Francis Dyke Acland, will deliver an address.

THE forthcoming reprint of the *British Pharmacopoeia*, 1914, will contain a slip showing the corrections made in this sixth issue.

THE sixth session of the Health Committee of the League of Nations was attended among others by the new member, Dr. Nocht of the Hamburg Institute of Tropical Diseases, Dr. Cummings, Surgeon-General of the United States Public Health Service, and Dr. Semyasho, Health Commissary of Soviet Russia. Nineteen countries were invited to take part in an exchange of sanitary staff—namely, Austria, Belgium, Canada, Czecho-Slovakia, Denmark, Finland, France, Great Britain, Greece, Hungary, Italy, Jugo-Slavia, Norway, Poland, Rumania, Russia, Spain, Sweden, and the United States.

PROFESSOR GEORGE R. MURRAY, D.L., M.D., has been appointed to represent the Victoria University of Manchester at the ceremonies connected with the centenary of the birth of Pasteur which will shortly be held in Paris and in Strasbourg.

H.R.H. PRINCESS MARY, VISCOUNTESS LASCELLES, has promised to present the prizes and certificates to the students of the London (Royal Free Hospital) School of Medicine for Women on Saturday, June 2nd. The school has scholarships of the annual value of £1,010, which in the next session will be awarded. Full particulars and forms of entry can be obtained from the Warden and Secretary of the school, 8, Hunter Street, Brunswick Square, W.C.

THE annual meeting and dinner of the Metropolitan Police Surgeons' Association were held at the Holborn Restaurant on April 26th, with Dr. Kennedy, the retiring president, in the chair. Amongst the guests present were the Right Hon. W. C. Bridgeman, M.P., Home Secretary, Sir Charles A. Ballance, K.C.M.G., chief surgeon to the Metropolitan Police, Sir Bernard H. Spilsbury, Dr. Cassidy, physician to the Metropolitan Police, Dr. Sanders, M.O.H. for West Ham, and Mr. Forrester Clayton, alderman of the Middlesex County Council. An enjoyable musical programme was given after dinner by Mr. Herbert Cave, Miss Edythe Barnard, and Mr. Webb.

THE Aberdeen University Club, London, is holding its sixty-ninth half-yearly dinner at Gatti's Restaurant on Thursday, May 17th, when Professor J. Arthur Thomson will take the chair. The honorary secretary is Dr. W. A. Milligan, 11, Upper Brook Street, W.1.

A MEETING of the West Kent Medico-Chirurgical Society will be held at the Miller General Hospital, Greenwich, on Friday, May 11th, at 8.45 p.m. The President, Dr. W. H. Payne, will deliver his presidential address. A smoking concert will follow, to which lady guests are invited.

THE North-East London Post-Graduate College has arranged an intensive course at the Prince of Wales's General Hospital, beginning on June 11th and lasting fourteen days. It will include lectures and demonstrations on clinical methods and cases, and work in the wards and special departments.

THE annual dinner of the Federation of Medical and Allied Services will be held at the Langham Hotel, Portland Place, W.1, on Wednesday, May 23rd, at 7.15 p.m., with the President, Sir Berkeley Moynihan, Bt., K.C.M.G., in the chair.

THE St. Bartholomew's Old Students dinner will be held on Wednesday, June 6th, at 7.30 p.m., in the Merchant Taylors' Hall, Threadneedle Street, with Mr. H. J. Waring in the chair. The honorary secretary is Sir C. Gordon-Watson.

AT a meeting of the Central Midwives Board for England and Wales on April 26th, Sir Francis Champneys presiding, two penal cases were heard, judgement being suspended for reports in three and six months. The principal business dealt with subsequently included the appointment of the Approvals Subcommittee and the reading of a letter from the Ministry of Health stating that the Minister approved for the purposes of the apportionment of contributions from local supervising authorities the balance of £5,280 11s. shown against the Board in the financial statement for the year 1922. The lists of lecturers and of institutions, homes, and midwives at which and under whom pupil midwives may be trained were submitted by the secretary, and approved for the year ending March 31st, 1924.

NORWOOD SANATORIUM for the treatment of inebriety and drug addiction has succeeded so well that its directorate has been compelled to seek elsewhere to found a second institution for the same purpose and to be run on similar lines. After much search a suitable mansion was discovered near Wickham Market in Suffolk. Rendlesham Hall, with its surrounding park of 270 acres, was bought, and on May 1st was opened as a home for patients suffering from inebriety or addicted to drugs. The resident medical officer is Dr. Walter Asten. On April 27th the Hall was inspected by a party of medical men and women and others interested in the subject. The mansion is magnificently situated in the midst of wooded country. Its own gardens are unusually beautiful. Every modern convenience necessary for the cure of the disease and the pleasure of the guests has been installed. Much credit should be given to Miss Dunn, the lady superintendent, for the very tasteful way in which the house has been furnished. Inquiries should be addressed to the resident medical officer, Rendlesham Hall, Woodbridge, Suffolk. At the conclusion of the visit Sir Sydney Russell-Wells, Sir Humphry Rolleston, Dr. Jane Walker, Sir Robert Armstrong-Jones, and others expressed their keen appreciation of the new institution and of the work of its directorate.

MESSRS. ADAM HILGER, LTD., have produced a modification of their optical sonometer and have applied to it the name Low-Hilger audiometer. It is a sensitive optical hymograph designed to record the pressure variation caused by sound waves.

THE Lord Mayor will preside at the 113th annual festival of the City of London Truss Society, which will be held at the Great Eastern Hotel, Bishopsgate, on Tuesday next, May 8th, at 7 p.m. The Society is a useful institution, and the trusses it supplies are prescribed by the surgeons who give their services to it.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediocra, Westrand, London;* telephone, 2630, Gerrard.

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin;* telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone, 4361, Central).

QUERIES AND ANSWERS.

"M. D." would be glad to hear of a place in Southern Italy suitable as a winter residence for a case of phthisis; the disease is stationary and of moderate extent. It is essential that an English or American doctor should be available.

INCOME TAX.

"N. J." bought a practice in 1921; owing to certain specific causes the profits have since been reduced, and "N. J." has claimed a reduction from an assessment on the three years' average basis. How should the gross receipts be computed?

*** The inspector of taxes is correct in objecting to the gross income being taken at the amount of the cash receipts in such circumstances. Tax is payable on profits earned, whether they have been realized or not. When a practice has been in the same hands for some years the amount of cash received in any one year is normally the same as the value of the bookings for that year, and is much more easily ascertained. It is for that reason that the cash receipt basis is usually accepted, but in the early years after a practice has changed hands the cash receipts do not provide a reasonable index to the value of the bookings and are, therefore, not accepted as the basis of a return. The correct gross income in "N. J.'s" case is the cash receipts for his first year *plus* the *value*—that is, after estimated allowance for bad debts—of the accounts open at the end of that year. In the second year the basis is the cash receipts *plus* the increase or less the decrease in the value of outstanding debts at the end of that year.

"CO. DURHAM" inquires as to certain expenses, and whether accounts annually rendered to the tax authorities in the past can now be reviewed.

*** (*a*) Each year's assessment stands by itself, although its computation involves two of the three years' profits dealt with on the previous year's assessment; if the expenses shown on those accounts were excessive, any appropriate adjustment can be made for the purpose of a new assessment; the same rule, of course, applies where the facts are in favour of the taxpayer. (*b*) Expenditure on books has not been specifically dealt with by statute or in the High Court, but we consider it to be allowable to the extent necessary to maintain (though not to improve) the practitioner's medical library. (*c*) Subscriptions to professional associations are allowable in the proportion which the association's expenditure for the year bears to its income. (*d*) Whether one-third or one-half of the rent, rates, etc., of the premises occupied is correct depends entirely on which ratio is more reasonable on the facts of the case. (*e*) The same applies to the estimate of the cost of the board, etc., of the maid employed for professional purposes. (*f*) Cost of professional periodicals—as in (*b*), we consider them allowable as necessary to keep professional knowledge up to date.

Car Transaction.

"J. M." bought a car in 1912 for £170 and sold it in 1915 for £70, buying another for £298; in 1921 he sold the latter for £175 and bought a car for £375. He estimates the 1921 cost of a car similar to that he bought in 1915 at £600. The 1915 allowance was presumably £170 – £70 = £100; the 1921 allowance due is £375 – £175 = £200.

LETTERS, NOTES, ETC.

DUPUYTREN'S CONTRACTION.

DR. DAVID A. ALEXANDER (Clifton, Bristol) writes: May I add to your note on the treatment of this affection (April 28th, p. 746) the suggestion of 5 per cent. ointment of salicylic acid? This I had been using with success in diffuse carnification of the plantar of the foot when I casually discovered a Dupuytren in a patient, a man in middle life who had for some time accepted his deformity. In several weeks the fingers affected—the third and fourth of the left hand—regained extension, and now only a slight tenseness can be found in the palmar fascia. Recent works on rheumatism include Dupuytren's contraction as a fibrositis.

A CASE OF CENTRAL PNEUMONIA.

DR. ARTHUR MARKSON (Bristol) writes: A girl, aged 6½ years, complained of severe headache and general malaise. Her temperature was 102° F., pulse 100, and respirations 22. Nothing definite was detected, except a few moist râles at the base of the left lung. On the following day the child sweated profusely, but the temperature was still 102° F. There was no pain nor cough, and the breathing was natural, but the râles persisted. I was called at 5 the next morning as the patient was much worse. The temperature was now 104° F., and she was semi-delirious. There were, however, no signs of meningitis, and the pulse-respiration ratio was still normal. A cerebral sedative was prescribed, but, although the delirium passed off, she remained in a state of cerebral excitement for two days. Her temperature kept between 102° and 104° F. for seven days, when it fell by crisis, and the child made a good recovery.

This was evidently a case of central pneumonia, affecting the lower lobe of the left lung, although the only signs elicited were the few liquid râles. There was never any sign of consolidation, the pulse-respiration ratio remained undisturbed, and the only clue to the diagnosis was that the temperature kept up for seven days and then fell by crisis. Beyond this there was nothing definite to point to acute lobar pneumonia. The interest in this case lies not only in the absence of associated signs and symptoms, but also in the severity of the cerebral symptoms, which, according to textbooks, are more commonly associated with apical pneumonia. It is possible that the case bordered on the so-called cerebral pneumonia, sometimes got in children, although the râles were quite distinct, and persisted throughout. I am indebted to Dr. M. F. Staniland for permission to publish this case.

WEATHER REPORTS BY TELEPHONE.

THE Post Office, in conjunction with the Air Ministry, has now made arrangements to communicate daily weather reports to the Telephone Exchanges throughout the country. For this purpose England, Scotland, and Wales have been divided into some forty districts, so that each Exchange may have available for subscribers information that will be appropriate to the area in which the Exchange is situate. It will only be necessary for telephone subscribers to ring up the operator at the local Exchange at or after 5 p.m. to obtain the forecast for the following day. No charge will be made beyond the local call fee (1½d.), and in the case of Rural Party Line subscribers no fee is payable. The forecast may be obtained also by ringing up from Public Call Offices, upon payment of the ordinary local Call Office fee.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 36, 37, 40, and 41 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 38, 39, and 40.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *187*.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	9	0
Each additional line	0	1	6
Whole single column (three columns to page)	7	10	0
Half single column	3	15	0
Half page	10	0	0
Whole page	20	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, W.C.2, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.